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CARRYING CAPACITY ASSESSMENT

ELEVEN POINT NATIONAL SCENIC RIVER

BY

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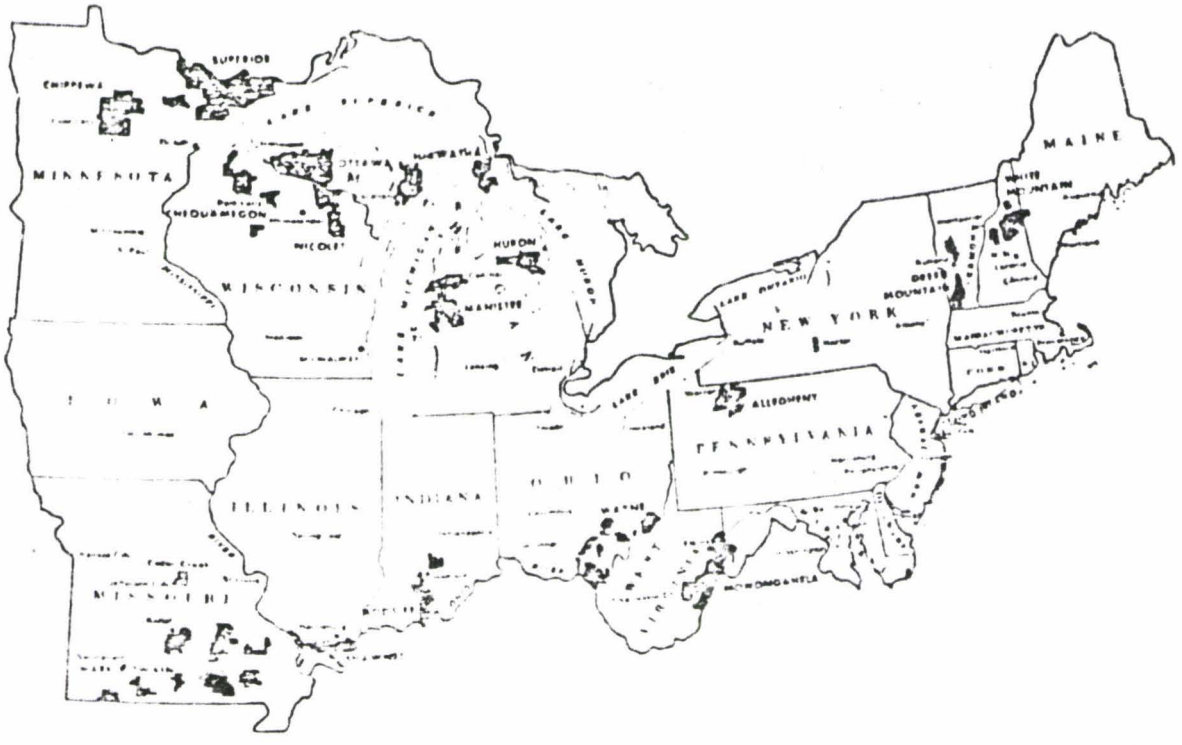
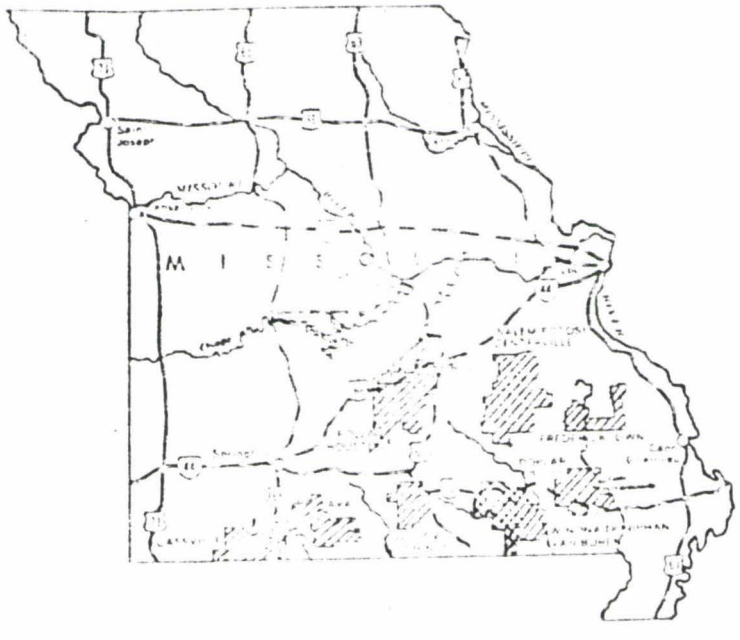


National Forests, Eastern Region.



Mark Twain National Forest.

The Eleven Point River originates near Willow Springs, Missouri, and flows southeastwardly through Howell and Oregon Counties for over 100 miles before merging with the Spring River in Randolph County, Arkansas. The watershed is in the Salem Plateau physiographic province of south-central Missouri and north-central Arkansas. This province is a part of the region called the Ozarks. Nearly 30 percent of the basin within Missouri is inside the Mark Twain National Forest boundaries. The 44.4 mile segment of the Eleven Point included in the Wild and Scenic Rivers Act is between State Highway 99 near Thomasville and State Highway 142 near Gatewood in Oregon County, Missouri. State Highway 142 is four miles upstream from the Missouri-Arkansas line.

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Preface

This paper is being prepared as part of a professional development program in outdoor recreation management conducted by the College of Forest and Recreation Resources at Clemson University in September and October of 1979.

Unfortunately, there has been very little, if any, work done to evaluate the carrying capacity of the Eleven Point National Scenic River since the early 70's. Major emphasis during the 70's was directed toward the completion of the acquisition phase of the Eleven Point Plan. Managers, up until this time, have been preoccupied with the conflicts and controversies that have been associated with the acquisition program and the condemnation of land.

As the acquisition phase nears completion, and crises management declinates, managers are taking a more positive look toward the management of the river. As positive steps are made in management, we find outselves faced with conflicts between carrying capacities and current trends.

It is the objective of this paper to outline a course of action by which an indepth evaluation can be made of the river and its past and present use patterns. The information gained from this project will be used to make management decisions and/or policy changes concerning a carrying capacity for the Eleven Point River. This same information will be used in the revision of the Unit Plan which is scheduled for completion by fiscal year 1983. This effort will be in line with National direction concerning river carrying capacity (U.S.F.S. 1978 Activity Review on National Wild and Scenic Rivers; the 2372.31 and 2372.03 (9) Sections of the Forest Service Manual; 240 Section of the Eleven Point Unit Plan). (See Table I and II.)

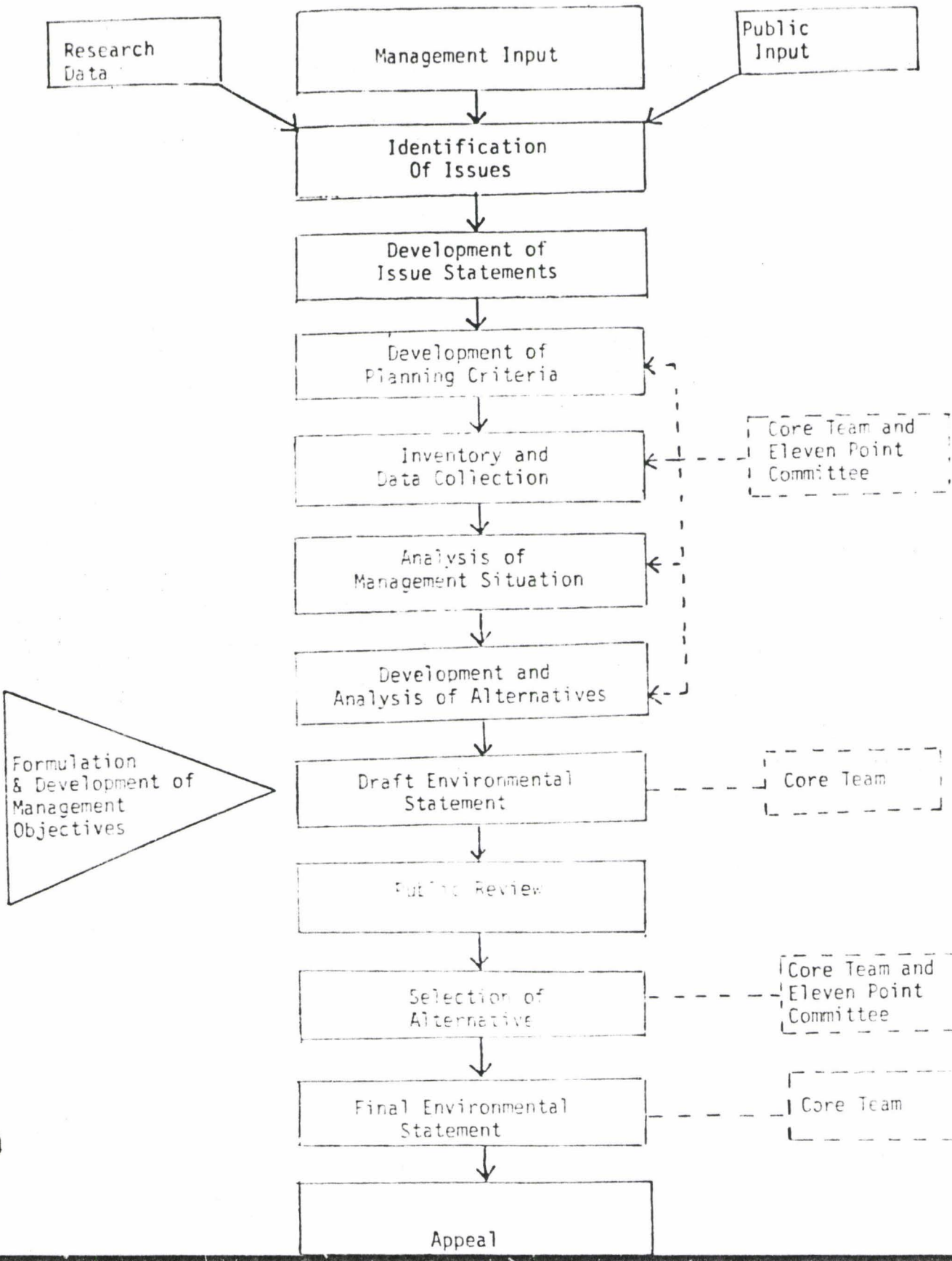
TABLE I.

Tentative Schedule of Combined Forest Planning and Eleven Point River Study Events.

Starting Date for Forest Plan	2/1/80
Initial Identification of Issues	2/21/80
Complete Estimate of Facility Carrying Capacity on the Eleven Point	10/30/80
Complete Mini-Sociological Survey on the Eleven Point	10/30/80
Criteria Input to Forest Core Team	11/1/80
Complete Evaluation of Park Service Ecological Studies	1/30/81
Development of Issue Statement for Forest Plan	5/1/81
Monitoring Camp Sites on Eleven Point	9/81
Formulation and Development of New Management Objectives for the Eleven Point	6/30/81
Selection of Tentative Carrying Capacity of the Eleven Point	8/15/81
Draft Environmental Statement to Public for Review	12/81
Filing of Final Forest Environmental Statement	7/82

TABLE II

PLANNING PROCESS



It was felt that my time could best be spent on this "top" priority project. Up until very recently, very little work and/or research had been done on this very controversial and complex subject. The first portion of this project will be concerned with the pulling together of 'existing' river data and documenting opinions and viewpoints of those people who have firsthand knowledge and experience with the river. The major emphasis or scope of the project will center around the management objectives, the various capacity estimates, monitoring, public involvement, the Code-A-Site system, funding, and finally the decision process. It is estimated that the total project will take eighteen to twenty months to complete. All work on the project will be done above and beyond the normal District's workload with 'no' extra financing. As many phases of this project will be initiated as physically possible by February 15, 1980.

The general format followed in this project comes from Tom Hebelein's outline for studying carrying capacity.

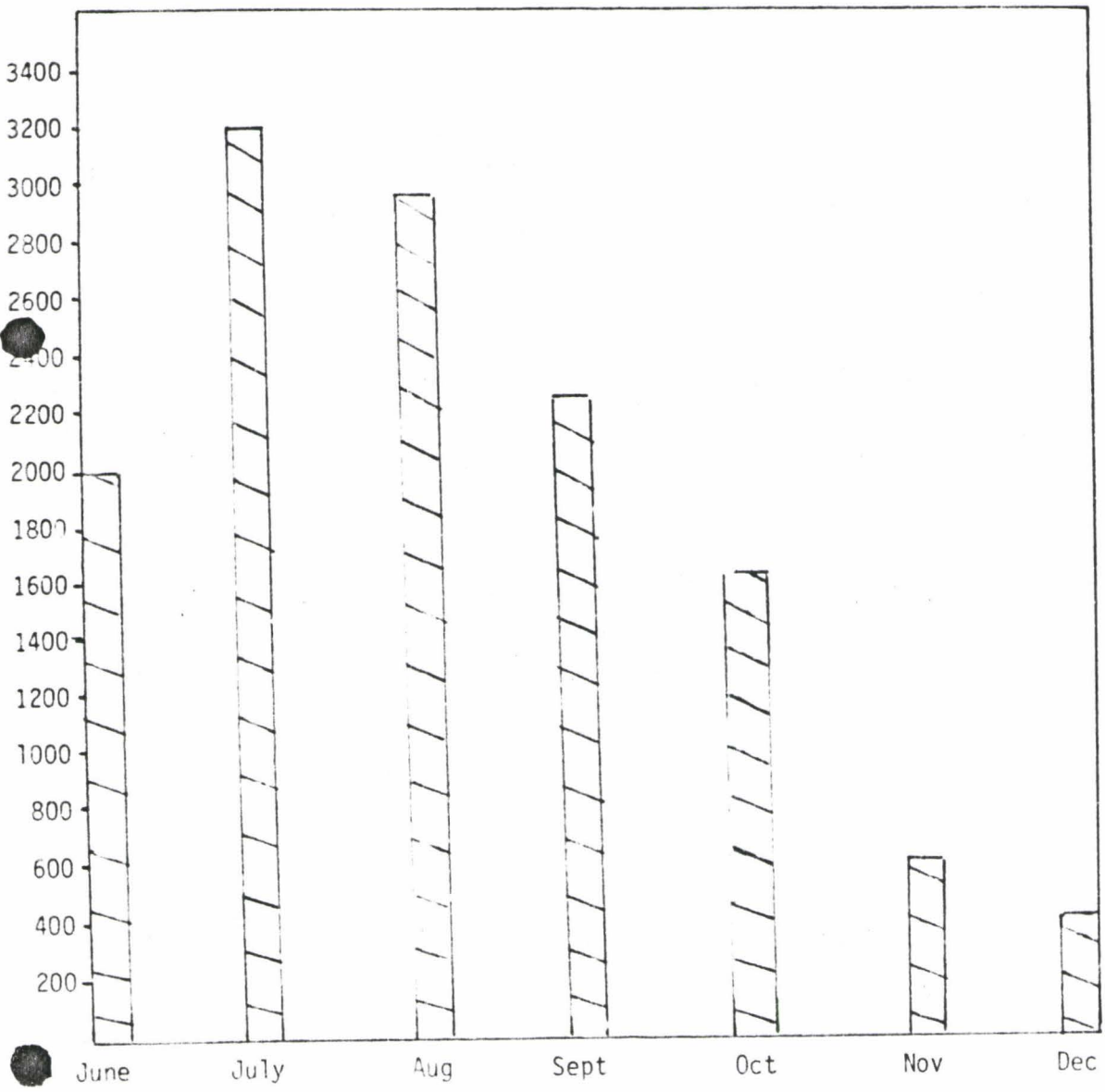
Background

There are 37 float streams with a total of 2,200 miles of floatable water located mainly within the Ozark Highlands. These streams are generally clear and fast-flowing, many spring fed, and located in a forest setting. Four of these rivers have been recognized as having National significance--Current River, Jacks Fork, Eleven Point and the Buffalo River. The first two comprise the Ozark National Scenic Riverways in Missouri. The Buffalo in northern Arkansas is a National Park. Both of these units are administered by the Department of Interior.

The Eleven Point River from Thomasville, Missouri to Highway 142 was designated a component of the National Wild and Scenic Rivers System under the Wild & Scenic Rivers Act of 1968, Public Law 90-542. Up until that time the Eleven Point River was relatively unknown and unused. Today the primary activity on the river is floating. Since 1968, use on the river has increased from an estimated 2,500 people in 1972 to 20,900 in 1978. Use on the river is by both local people who usually travel in motor driven john boats and non-local visitors who prefer to paddle a canoe. This use has been very unevenly distributed in the past. One segment of the river (Greer to Riverton) receives extremely heavy use while other portions are hardly used. This occurs because of a tendency for some access points to be used more than others (Greer Crossing). This is largely due to differences in developments and outfitter preference. Our figures indicate that on weekends during the use season (April thru October) there was an average of 205 canoes put in at Greer Crossing. Greer Crossing is the major put-in point on the river. It is estimated that 96 percent of all canoeist put in at Greer during the 1979 use season. (Fig. 1). The 205 canoe estimate does not cover canoes put in at Thomasville, Cane Bluff,

NUMBER OF VEHICLES VISITING GREER CROSSING, 1979
ELEVEN POINT NATIONAL SCENIC RIVER
MARK TWAIN NATIONAL FOREST

Figure 1



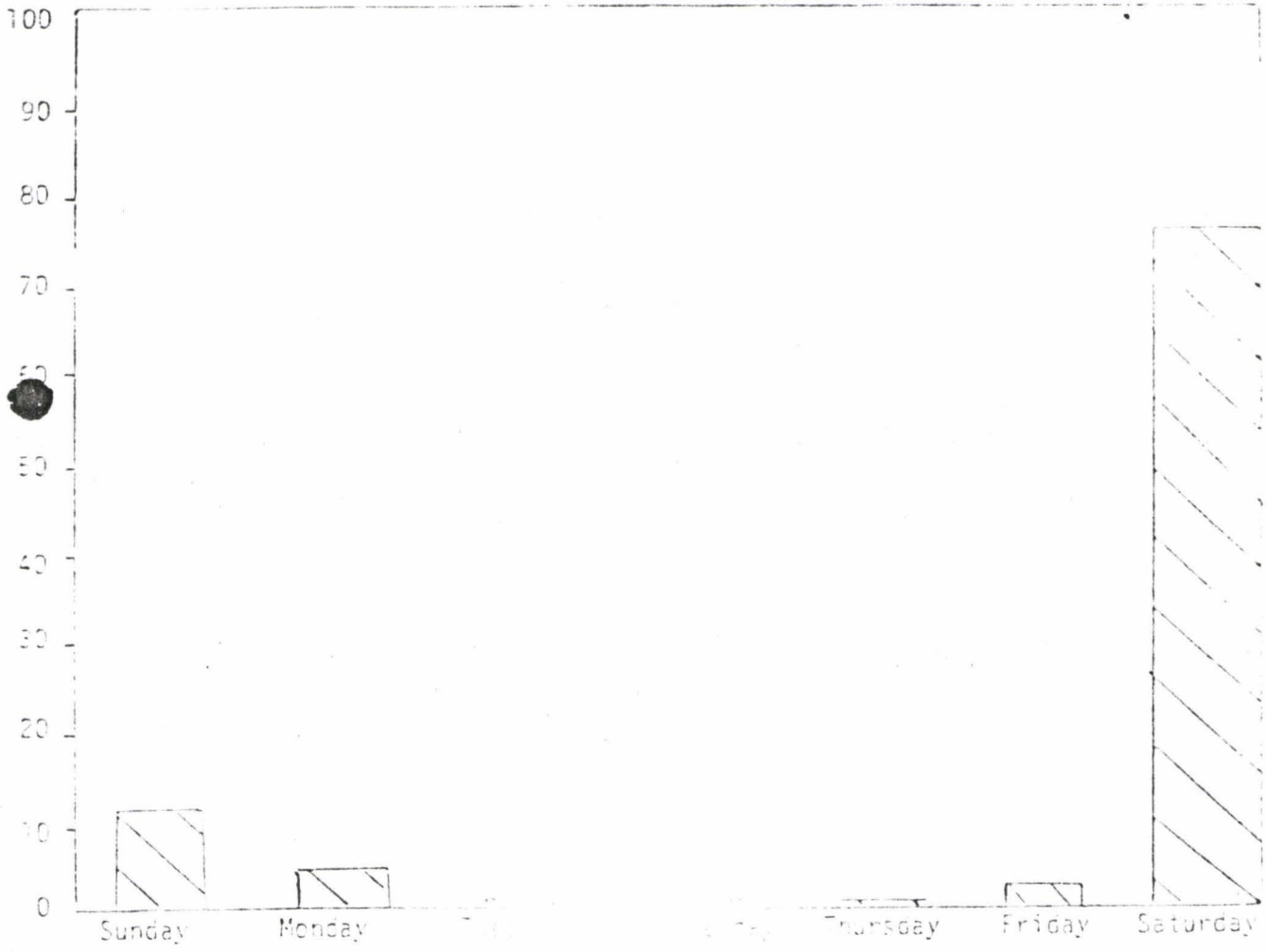
Turner Mill, Bliss Spring, Riverton or Highway 142. Neither does this figure cover those put in at Greer after 2:00 p.m. on Saturday and Sunday. Midweek use on the river represents about 10 percent of the total and creates very few management problems. Approximately three fourths of the total number of canoes put in at Greer Crossing are put in on Saturday. (Fig. 2). Our use figures for 1979 show a decrease, but it is felt this is due not to a lack of interest, but to the increased cost of and the uncertainty of available gasoline in this area.

Currently there are two commercial outfitters under permit and authorized to conduct business on the Eleven Point River. These two outfitters were operating on the river prior to the establishment of the Scenic River. These two outfitters provide canoe service for about 70 - 75 percent of the Eleven Point River floaters. At this time, these two outfitters collectively own somewhere around 450 canoes. Private canoes make up 20 - 25 percent of the use.

It is hoped the end result of this project will identify what actions must be taken to reduce or distribute use on the Eleven Point National Scenic River.

DISTRIBUTION OF CANOE USE BY DAY OF WEEK
GREER CROSSING, 1979
ELEVEN POINT NATIONAL SCENIC RIVER
MARK TWAIN NATIONAL FOREST

Figure 2



General Literature Review

With the demand for river recreation increasing at unprecedented rates, much attention has recently been directed toward carrying capacities and methods of limiting or distributing use. Soloman and Hanson, in their experience on the Pine River in Michigan, believe that lack of regulations would result in continued increases in canoeist numbers. This trend would be to the detriment of those who object to "crowding" and those who are seeking "solitude". Increased use also tends to compound problems such as "not enough campgrounds and other facilities, littering, and conflicts of viewpoints between fishermen and canoeists, and motorized and non-motorized watercraft". Conflicts between various kinds of river users or between landowners and river uses, involving trespass, litter, and noise, often arise because of increased use (Lime, 1975). Changes occurring in large wildland situations are a basic and continuing part of capacity concerns (Wager, 1964; Lime and Stankey, 1971; Lime, 1979).

"Carrying capacity" has emerged as a critical concept in river management since it theoretically defines the capability of the area to withstand use in terms of protecting the resource and maintaining the quality of the user experience. For some rivers, the situation is reaching crisis proportions - the physical environment is being damaged beyond acceptable limits and the people visiting these areas are no longer receiving a quality or enjoyable outdoor experience.

Determining recreation carrying capacity is frequently voiced as the managers answer to solving the problem of overused rivers. However, determining carrying capacity is a complex and troublesome concept that incorporates principles of the social as well as the physical and biological sciences (Herberlein 1977). Carrying capacity is a dynamic concept, a framework or way of

thinking about how to plan and manage a particular recreation resource (Lime, 1979). It is not a magic formula which tells us "how much use is too much". In many cases there is a considerable difference of opinion of overcrowding by the user and management. In most cases, the user considers his personal satisfaction as the main guideline for overcrowding while the manager will usually go by resource damage.

Deciding how much and what kind of use is acceptable for an area, must be based on managerial judgement and experience, as well as budgetary and resource constraints. The uncertainty of carrying capacity decisions can be substantially reduced by a consideration of the interrelationship of: management objectives, recreation user attitudes, and impacts of use on natural resources.

It is totally agreed that carrying capacity can only be established within the context of management objectives (Wagner 1964; Lime and Stankey 1971; Lucas and Stankey 1973; Herberlein and Sherby 1976). These objectives must define what type of recreational opportunity or opportunities the area is going to provide.

Determining carrying capacity ultimately requires the consideration of human values. Management objectives and capacities will be more viable and defensible against public criticism if the manager can carry on an active dialogue with a variety of publics. It is important to know who may oppose various management actions (Lime, 1979). Although administrators cannot manage by public opinion alone, these opinions can help the manager narrow the range of uncertainity in the decisions he makes. Some visitors' desires could lead to unacceptable damage to the resources. Obtaining public opinion is a must because many foresters perceive the forest environment differently from recreationtists (Hendee & Harris 1970; Stone & Tawes 1958). Some warn that without adequate public participation in resource decision making resource managers will find themselves in the backwash of the environmental movement, serving as mere resource custodians with most decision making in other hands (Hansen, 1970).

The resistance of an area's resources to use is an important constraint on carrying capacity. Knowing how the resource is affected by various levels and types of use does not by itself tell the manager what is an acceptable amount of change to permit (Lime & Stankey 1971). To define what change shall be permitted, the manager should relate resource change to specified management objectives (Lime, 1979).

The manager, in selecting a technique or combination of techniques, should seek to: (1) Reduce conflicts among competitive users; (2) Reduce the destructiveness of some users; (3) Increase the durability of the physical resource; and (4) Provide increased opportunities for visitor enjoyment (Lime, 1979). These goals can be achieved by three types of control measures - site management, direct regulation of use, and indirect regulation of use.

Site management techniques can have an immediate and significant effect on the character of the area and the kind of recreational opportunity offered. Drastic or even seemingly subtle changes in the design and type of facilities can alter the character of the site to the point it may no longer be satisfactory to many users.

Direct controls regulate when visitors can use the area, what area they can use, how long they can stay and what activities they can engage in. If direct methods are used they should be applied as far in advance of the visitors arrival at the site as possible. Many people go to the Wilderness because of a desire for freedom and independence. To impose direct controls which restrict this freedom and independence unnecessarily whould not be good (Peterson, 1977).

Indirect controls are more subtle and less obtrusive. They do not interfere directly with an individuals freedom of choice. They seek to modify user behavior without the user being aware of this influence. Indirect methods should be tried and evaluated before

the more authoritarian, heavy handed kinds of action are pressed into service.

Ultimately, the recreation manager is still left with the difficult decision of deciding how much and what kinds of use are acceptable for a given area, and how and where such uses are to be managed and sustained. Without a marriage of managerial judgement and facts, the quest for quality recreation management appears destined for "rougher days" Lime 1979).

In the Superior National Forest, managers have attempted to reduce congestion and crowding by preparing a brochure that described past BWCA use. Visitors can use this information to avoid crowded areas and peak-use periods (Lime & Lucas 1977).

At least one-third used the brochure to select an entry point, or route, or a time to visit the area. Such brochures need not be fancy and expensive with glossy covers and colorful pictures. It is nonauthoritarian and can serve the visitors' desires rather than restricting and regulating him. Information supplied to visitors has been suggested as a promising technique for redistributing use.

Previous Recreation Studies on Missouri Rivers

Earlier visitor studies conducted on rivers in southern Missouri have focused on human factors which determine recreational carrying capacity, defined by Lime and Stankey (1971) as "the character of use that can be supported over a specified time by an area developed at a certain level without causing excessive damage to either the physical environment or the experience for the visitor". In essence then, these research projects attempted to describe how visitors evaluated various aspects of their river experience, such as litter, scenery, crowding, and developed facilities.

Four recreation studies have been undertaken recently at the Ozark National Scenic Riverway, which includes portions of the Current and Jacks Fork Rivers. These rivers lie between 20 and 60 miles north and east of the Eleven Point River and are administered by the National Park Service.

In a study of first-time visitors to the Riverways, Gisi (1971) found that these users anticipated a scenic area that was unlike other places they had visited. Almost all respondents said they had realized their expectations. Habermehl's (1973) investigation of floaters' perceptions of crowding on sections of the Current and Jacks Fork Rivers determined that 23.5 percent of those sampled encountered greater crowding than expected, and 27.4 percent felt the Riverways were more crowded than they desired. Characteristics of large groups were described by Wehrung (1975). In another study, Brown (1976) found that over 95 percent of the local fishermen he interviewed perceived an increase in the number of canoeists during the preceding five years. However, slightly more than half of these fishermen said they had not changed their fishing habits as a result of heavier canoe traffic.

Taken together, these four research projects have begun to provide the National Park Service with a picture of who comes to the Ozark National Scenic Riverways and how these visitors experience the total environment of the Riverways, including their interaction with the other people there. It would almost surely be a mistake however, to assume that visitors at the Current and Jacks Fork Rivers are identical to people who travel to the Eleven Point River. Besides differences in each rivers' geographic location, and individual character, the Ozark National Scenic Riverways were established primarily as recreational rivers, whereas the Eleven Point River was designated a scenic river. By congressional mandate, more development--signs, campgrounds, interpretive facilities, etc.,-- will take place along the Ozark Riverways.

Chilman designed and inititated a research program in 1971 which measured canoeists' perceptions of crowded conditions on the Ozark National Scenic Riverways. It presently is being used to monitor changes in perceived recreation "quality" on the Riverways.

During the summer of 1971, Duffield (1972) conducted a survey of Eleven Point River floaters. Like the studies done at the Ozark Riverways, Duffield's primary objective was to gather information that would help the administering agency (the Forest Service in this case) to determine the rivers' recreational carrying capacity. Data was collected through short, on-site interviews followed by mailed questionnaires.

Besides seeking background information on visitors demographic characteristics and activities, Duffield probed the quality of an Eleven Point River experience: What were the high and low points of visitors' float trips? How did visitors rate the Eleven Point's quality in comparison with other nearby rivers? How has the quality of an Eleven Point River float trip changed over time?

He found that "a float trip experience on the Eleven Point River is possibly the best in Missouri and almost certainly one of the top three".. The high point of most people's float was the river's natural beauty and the challenge of the fast water and rapids. Crowding and litter were frequently mentioned low poirts, and most repeat visitors felt that the crowding problem had worsened since their previous trip.

During the summer of 1976 Bousquet conducted a survey to determine the demographic and behaviorial characteristics of visitors to the Eleven Point National Scenic River. His work will be used as a basis for developing and evaluating interpretive services on the river. His study has been very helpful to the Forest Service in seeing the Eleven Point River through the eyes of its visitors.

In the summer of 1977 the North Central Experiment Station initiated their National River Recreation Study on the Eleven Point River. The objectives of the study were to identify,for a variety of river recreation activities and environments, demographic and experience characteristics of recreation users, reasons for taking river trips, factors which affect the quality of river recreation experiences, and reactions of users to specific river management practices. The study was made on selected rivers throughout the nation. Here in Missouri the Eleven Point, Piney, and North Fork were studied. This study should allow managers to compare how both the patterns of river recreation use and the charateristics of users vary within individual rivers, between different rivers, and across time. Although some of their data is presently available, the final publication is not due until June of 1984.

Legislative History

Just as soon as the National Forest was established in Missouri, the U. S. Forest Service recognized the free-flowing Eleven Point River as being outstanding among the waters of Mid-America. These values were given special emphasis in 1936, when a basic plan was drawn up for the protection and development of designated recreational use areas. As a result of the 1936 recreational policy, the Eleven Point River was designated a National Forest Recreation Area in 1958.

In 1961, the Senate Select Committee on National Water Resources recommended that "...certain streams be preserved in their free flowing condition because their natural scenic, scientific, aesthetic, and recreational values outweigh their value for water development and control proposed now and in the future".

The Committee's report was soon followed by a recommendation from the Presidentially appointed Outdoor Recreation Resources Review Commission, that a National System of Wild Rivers be instituted to protect rivers that should remain forever free. Legislation was introduced -- in the first session of the 89th Congress -- designating five rivers for inclusion in the system. One of them is the Eleven Point River of Missouri.

By 1965 the river's wild and free qualities had assumed National significance. To counteract threats that would degrade, if not destroy its natural character, the Government of Missouri and various State agencies similarily asserted that the river should remain free flowing.

The Forest Service assumed responsibility for administration of the Eleven Point National Scenic River when the Wild & Scenic Rivers Act (90-542) became law in 1968. The law required the Forest Service to classify the river, establish a boundary, and implement the classification through a management plan. With the acts objectives in mind, the first plan, known as the River Plan

Eleven Point, was developed by the Mark Twain National Forest. After considerable public involvement and professional resource analysis, the Eleven Point was classified as a Scenic River. A plan was submitted to Congress and published in the Federal Register. The present unit plan was then developed and approved by the Regional Forester in 1973. The first revision of this plan was done in 1975 and the second will take place as a part of our Forest Planning effort in 1981-82.

Administrative Constraints

The National Wild & Scenic River Act mandates the Forest Service to preserve the "outstandingly remarkable" values while providing a variety of opportunities for outdoor recreation use in National Forest System river corridors. Accordingly, scenic rivers will be managed to provide a recreation experience in a natural setting.

The following "policy" statements were taken from the 2372.03 Section of F. S. M. --Wild, Scenic, and Recreation Rivers:

#2 - Manage the use of rivers with a minimum of regulation.

#4 - Manage rivers which are entirely or partially within a component of the National Wilderness Preservation System in a manner which will feature the preservation of the Wilderness resources including solitude, natural environments, and opportunities for primitive, unconfined activities offering challenge.

#9 - Establish a combination of use limits and other management procedures which best achieve the objectives of the Act and provide substantial benefits to the public.

#10 - Publish allocation processes necessary to control or modify visitor use in the Federal Register prior to implementation.

Under Section 6, subpart (a) of the Act:

> The Secretary of Agriculture shall not acquire fee title to an average of more than 100 acres per mile on both sides of the river.

Our interpretation of this Section was that, "the boundary was established to include an average of not more than 320 acres per mile on both sides of the river".

Under Section 6, subpart (b)

> If fifty percent or more of the entire acreage within a Federally administered wild, scenic or recreational river area is owned by the United States, the Secretary shall acquire fee title to any lands by condemnation under authority of this act.

Under Section 13, subpart (f)

Preserves existing rights of State (including right of access) concerning the beds of navigable waters which are part of the system.

Under Section 13, subpart (a)

Recognizes State jurisdiction over fish and wildlife and provides that hunting and fishing will be permitted in system rivers in accordance with applicable State and Federal laws.

Under Section 13, subpart (d)

Reaffirms State jursidiction over the waters of system rivers as long as such jurisdiction remains consistent with the purposes and administration of the Act.

The legislation also provided for the purchase of less than fee interests for some lands, and considerable acreage has been purchased as scenic easements. Some of these landowners have retained certain rights such as timber harvesting and watering rights. Less than fee ownership reduces management options on these particular lands and those of adjacent lands (access roads, utility lines, etc.).

Under Section 6, subpart(g) (2)

"A right of use and occupancy retained pursuant to..." There is only one tract of land that has been acquired with an encumbrance. This term estate expires 12/15/1996.

The Eleven Point National Scenic River Zone has approximately 160 miles of unsurveyed, unmarked boundary lines. To locate the necessary property lines on the river involves approximately 90 miles of scenic river boundary located in nine townships which will require subdivision of approximately 64 sections. The total survey will probably require in excess of 420 miles of line. The potential for encroachment, especially cattle and timber, will continue to exist until the survey work is completed. Many future law enforcement cases will be lost without legal line identification.

When our land acquisition project on the river is completed, there will be the following land ownership breakdown:

Total acres within river boundary	14,195	
Fifty percent authority in fee		7,097.5
Fee acres owned by F. S. prior to Scenic River		3,115.0
Acquired fee acres by Scenic River authority	3,487	
Buffer acres	495	
Scenic Easement Acreage Acquried	4,296	
Acres inside river boundary not acquired by fee or scenic easement		802.0

Description of the Resource

Geographical Content

The Eleven Point National Scenic River is located in the Ozark Highlands of southeastern Missouri just above the Arkansas State Line. The topography is one of hills, plateaus, deep valleys, and impressive bluffs. Much of the area is underlain by soluble limestones and dolomites. Over time erosion has formed the classic karst topography of the area. Sinkholes, springs, and caves are common.

The soils in the area are generally loess derived and cherty residual soils on ridges and sideslopes. Loam and sandy loam alluvial soils make up the bottoms.

Climate in this part of the Ozarks is characterized by warm summers and mild winters, which permit year round recreational use of the resources. The most favorable temperatures for water-based recreation occurs from April to October. Precipitation averages 45 to 50 inches per year. Streamflows are greatest during April and May, and lowest in August and September. Water quality is exceptionally good throughout the year.

Floaters who use the Eleven Point River hail from more than seven different states and over 100 different towns (Bousquet 1976). Visitation to the Eleven Point is heavily influenced by the following Regional population centers:

City	Population	Miles
Memphis, Tenn.	660,000	170
St. Louis, Mo.	622,236	190
Kansas City, Mo.	507,330	309
Springfield, Mo.	120,096	142

Approximately 50 percent of the visitors to the Eleven Point come from Memphis, Tenn. and St. Louis, Mo. Another nearby National River may explain why more of the Eleven Point's floaters come from Memphis than St. Louis. Although they are equidistance from the Eleven Point River, drivers from St. Louis cross the Ozark National Scenic Riverways about 40 miles before they reach the Eleven Point. There is also low river use by Arkansas floaters. This may be due to the fact that the Buffalo National River is located closer to the larger Arkansas cities.

The main north-south highways serving the Eleven Point River are Missouri Highways 19, 99 and J. Main east-west routes include U. S. Highways 60 and 160, and Missouri Highway 142. There are no railroads or airports supplying service to this part of Missouri.

Recreation activities within the communities of Alton, Wilderness, Winona and Birch Tree are very closely tied and related to the Eleven Point River. Local users, while fewer in number, tend to partake in more of the consumptive types of recreation (hunting, fishing, trapping, gigging, etc.). They also use the river for picnicking, swimming, camping and baptisms.

Political Climate

Time did not permit the full completion of this extremely important section. This section will attempt to identify and analyze the positions of all the various interest groups concerned with the Eleven Point National Scenic River. It would also attempt to identify all agencies that might be involved in the management of the Eleven Point. Each agencies applicable jurisdiction would also be documented in this section. (See Public Involvement Section, Pages 60 and 61).

Factors Specific to the Resource Itself

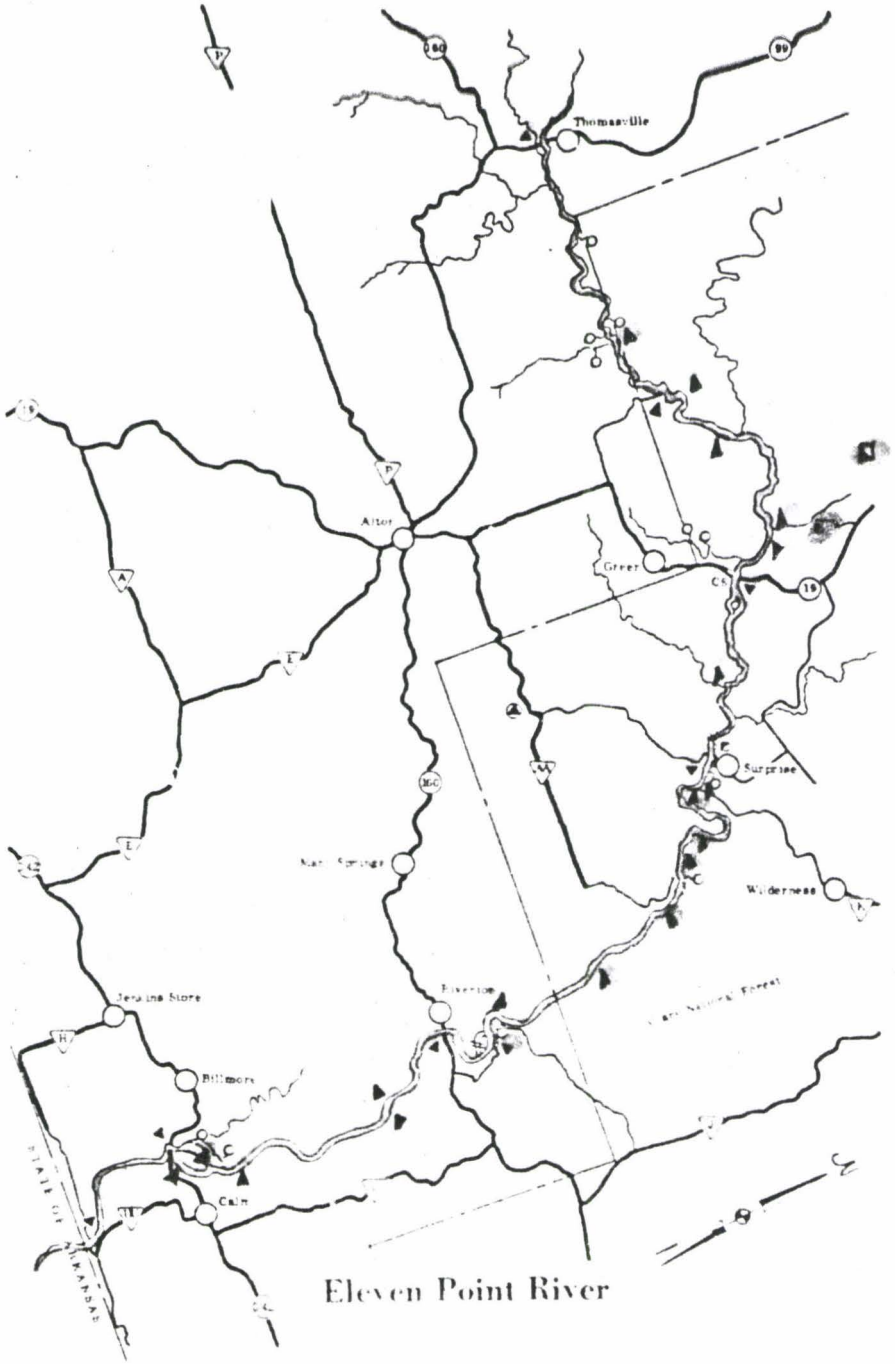
Physical Description

The bluffs, caves, azure-tinted springs, and fast, clear water make the Eleven Point one of the most beautiful rivers in our community.

Seven access points and eight float camps have been approved along the designated Scenic River by the U. S. Forest Service. The locations of existing and planned float camps are shown in Figure 3 . Auto campsites at Greer Crossing and McCormack Lake receive heavy use by floaters. Typically, floaters put in at Greer Crossing (Route 19) on Saturday mornings, camp on the river, and take out at Riverton (Route 160) on Sunday afternoon. Little floating occurs between Thomasville and Greer Crossing during the Ozarks dry summers because the water is usually too low. Greer Spring contributes over half the volume of the river, so the Eleven Point is usually floatable beyond this point the year round. From Riverton south to the Narrows (Route 142) the river is not as heavily used as the Greer-Riverton stretch, mainly due to lack of development and promotion by the outfitters.

Flash flooding, typical of Ozark streams, is an important influence on the river, and will continue to be a major consideration in planning and providing service to the public.

Figure 3



LEGEND

- Access
- Developed Float Camp
- Planned Float Camp
- Developed Campground
- Spring

Management

Formal Chain of Command

Position and/or Title	Present Incumbent
Secretary of Agriculture	Bob Bergland
Chief of Forest Service	Max Peterson
Regional Forester, Region Nine	Steve Yurich
Forest Supervisor, Mark Twain	Leon Cambre
District Ranger, Winona R.D.	Art Easterbrook
River Manager, Eleven Point National Scenic River	Bob Gardner

Responsibilities

Chief - The Chief is responsible for:

1. Transmitting the public hearing notice, proposal brochure, and environmental statement to appropriate Federal Agencies in Washington, D. C.

2. Approving draft and final Wild and Scenic River Study Reports. If the final study report recommends the designation of a component of the National Wild and Scenic River System, he must also recommend approval to the Secretary of Agriculture.

3. Coordinating, for the Secretary of Agriculture, submission of study proposals to the Secretary of Interior, Secretary of the Army, the Chairman of the Federal Power Commission, and any other affected Federal Department or Agency.

4. Notifying the concerned Regional Forester of the date the approval proposal and draft environmental statement are filed with EPA.

Regional Forester - The Regional Forester is responsible for:

1. Recommending approval of the draft Wild and Scenic River study report.

2. Preparing approved study report and draft environmental statement for publication.

3. Holding public hearings on the preliminary findings regarding the suitability of an area as a potential addition to the National Wild and Scenic River System. In regard to these hearings, the Regional Forester will:
   A. Submit a public hearing notice to the Chief for publication in the Federal Register.
   B. Ensure that notice of public hearing is published in six newspapers having general circulation in the area and in the newspaper of adjacent communities.

C. Notify the Governor of each State in which the affected lands are located of (1) the proposal for future management of the area and (2) the notice of public hearing.

D. Provide appropriate notice to the governing board of each county in which the affected lands are located.

E. Ensure that appropriate regional and local offices of interested Federal Agencies are notified.

F. Bring the public hearing to the attention of congressional delegations and interested groups.

G. Recommend presiding officer for public hearing.

H. Analyze and summarize the testimony and all written views presented for the public hearing record.

4. Recommending approval of the final Wild and Scenic River Study Report. He will support a definite course of action in the final report and final environmental statement.

5. Ensuring that river studies are made in close cooperation with affected State and local agencies, and studies will be carried out jointly with those agencies if the State requests such an approach. Included in such studies will be a determination of the degree to which State and local agencies might participate in the preservation and administration of the rivers if they are added to the system.

Forest Supervisor - The Forest Supervisor is responsible for:

1. Planning investigations to accomplish review of Wild and Scenic River Study Areas.
2. Developing proposed long-term management direction for study rivers through the draft proposal and environmental statement process.
3. Ensuring that river studies are made in close cooperation with affected State and local agencies and that studies are carried out jointly when so requested.

District Ranger - The District Ranger is responsible for:

1. Ensuring that the river is managed consistently, in a manner which is legally and administratively just, and with the intent of retaining and enduring river resource.
2. Balancing use of the river corridor according to objectives established in the River Management Plan.

The above responsibilities were taken from the Wild and Scenic River Review Draft of August 1978.

User Description

The Eleven Point National Scenic River draws a regional rather than National visitorship; 95 percent of its visitors come from five states: Missouri, Tennessee, Illinois, Mississippi, and Kansas (Bousquet 1976). Local people, who up until about ten years ago had the Eleven Point largely to themselves, now make up less than 10 percent of the floaters on the river.

The Eleven Point River has an established clientele of repeat visitors. Bousquet in 1976 found that slightly over half (53%) of the floaters had previously floated the river. The North Central 1977 National Recreation River Study indicated that 39.7 percent of the floaters had previously floated the Eleven Point.

Bousquet in 1976 found that 60 percent of the groups using the river were small in size, six persons or less. Researchers have also found that most floaters on the river were between 15 and 39 years old and came from cities or their suburbs.

Past and Current Use Levels

Use trends on the Eleven Point River have been increasing at a slower rate than other Nationally significant rivers in the Ozark Highlands (Fig.4). This difference is due to several factors: (1) The difference in classification and development of the rivers and their geographical locations, (2) The single fact that the Buffalo, Jacks Fork and Current Rivers are closer to a larger number of metropolitian areas. These factors will have a major effect upon future use on the Eleven Point River.

Although the Forest Service objective is to disperse use on the 44.4 miles of the river, use and research data show that the trend over the past eight years has run counter to the management objective. Ninety-five percent of the 1979 floaters put in at Greer Crossing compared with Bousquet's 89 percent in 1976 and Duffield's 64 percent in 1971. Since Duffield's study in 1971, the proportion of floaters taking out at Riverton has increased sharply and has been accompained by a corresponding decrease in the use of Turners Mill and Route 142 as take-out points. (Figure 5).

Bousquet, in 1976, found that 60 percent of the floaters that put in at Greer Crossing camped out on the river for at least one night. The balance of the users complete their float in a single day. He also found out that only six percent planned to stay on the river past the weekend. Bousquet found that the majority of campers camped at convenient locations along the river, instead of the developed float camps. Although the Eleven Point does not have a great number of gravel bars, there are plenty of wooded areas with sparse gound cover that offer good campsites by the river's edge.

Figure 4

Comparison of Annual Canoe Use
On
Three National Rivers

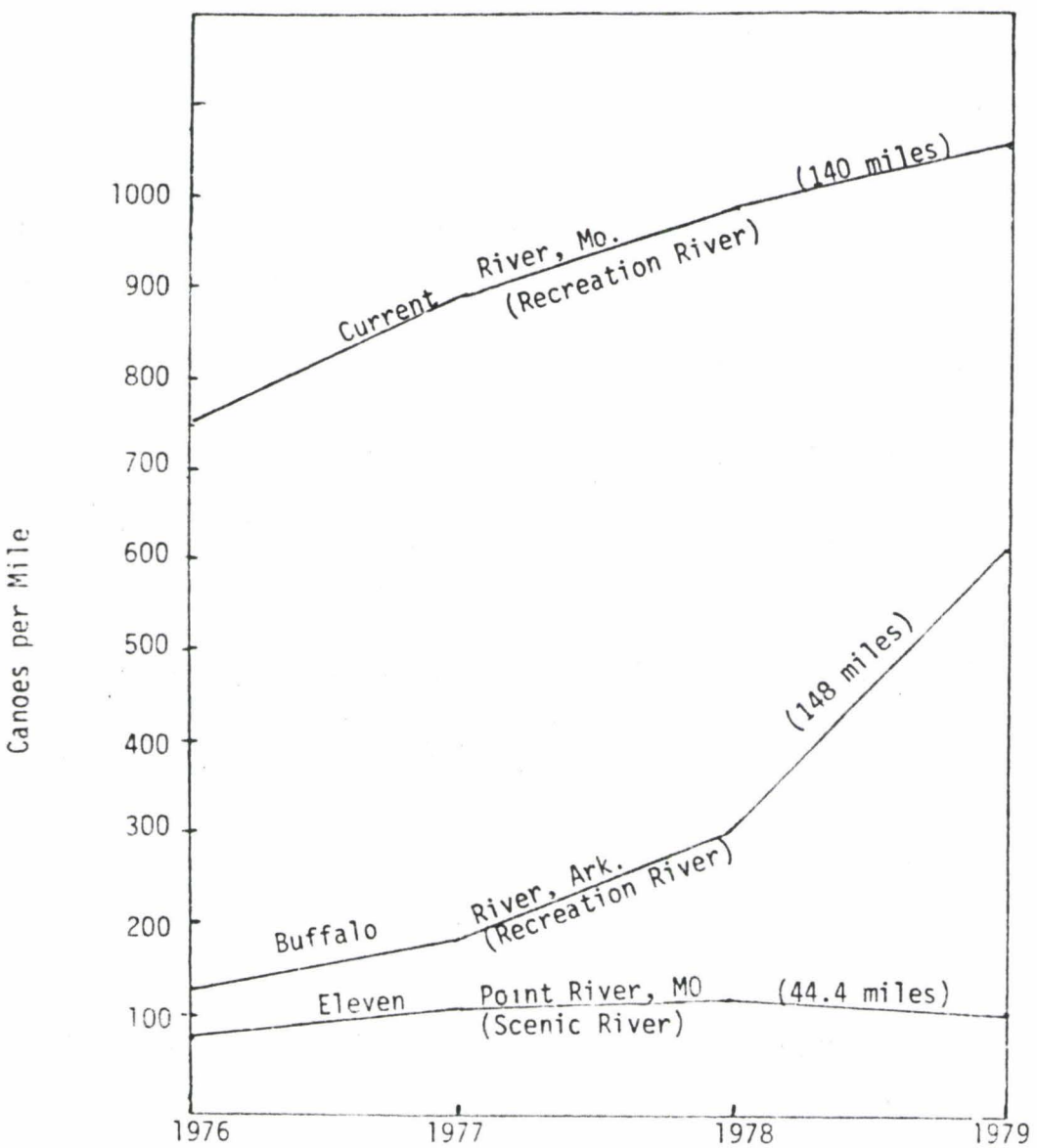
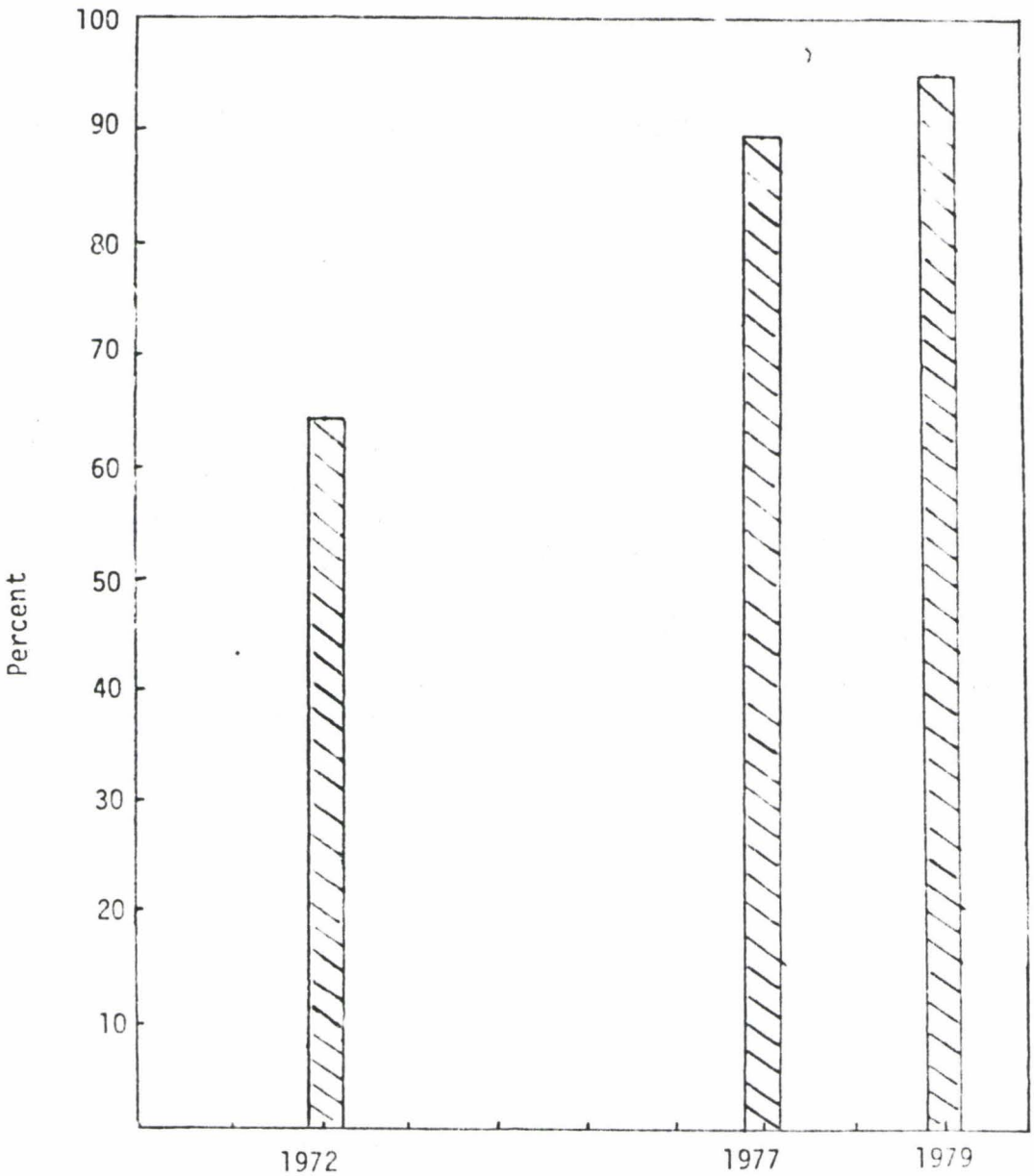


Figure 5

PERCENT OF PEOPLE USING
GREER CROSSING
AS A LAUNCH SITE



Developed float camps are purposely built back from the edge of the river to minimize bank erosion problems and to maintain the rivers unspoiled setting. It is a fact that many visitors do not stay in developed float camps, precisely because the camps are located off the river. As found elsewhere, most people prefer camping at the waters edge. Camping close to the waters edge has several advantages: Gear doesn't have to be carried so far, swimming, view of river, and less mosquitoes, black flies and snakes. Camping along the Eleven Point River is a complex problem. There are not enough float camps for people who plan to use them, and not enough riverside gravel bars for visitors who prefer these sites. As a result, many unofficial riverside campsites have been established and their increased use has caused some bank erosion problems and vegetative destruction.

The Recreational Activity

Sport fishing is popular along the Eleven Point, and the Missouri Department of Conservation stocks the river from Greer Spring south with rainbow trout. Swimming, by itself or in conjunction with a float trip, is another frequent use of the Eleven Point River. Like fishing, swimming occurs at scattered locations up and down the river.

Within the Scenic Zone, picnicking takes place at Cane Bluff, Greer Crossing, Turners Mill, Boze Mill, Riverton West and at the Narrows. Visitors also come to the Eleven Point River for sightseeing (primarily at Greer Spring and the Narrows), backpacking, nature study, caving and photography. At this time, the Forest Service has very few trails for hiking. Neither off-road vehicles or horseback riding will be allowed within the Scenic Zone when the management plan is fully implemented.

Scope of Work

For the past seven years our guidance on carrying capacity has come from our Unit Plan, which calls for a base figure of four canoes per mile. This Bureau of Outdoor Recreation space standard was taken from capacities which had been set for Wisconsin Rivers. Present management feels that the flat capacity of four canoes per mile is too low for present use patterns. The following policy statement concerning carrying capacity is found in 240 Section of the 1973 Unit Plan:

1. A combined administrative study and research project will be pursued to determine the carrying capacity of the Eleven Point River to support recreation use. A program of research was started in the summer of 1971 as a basis for carrying capacity determination.

2. A carrying capacity will be set for the river upon which planning and management will proceed, until the carrying capacity study is completed.

Todate there has been no effort or direction to start a carrying capacity study as called for above. It is hoped that the final result of this project will be a carrying capacity which can be approved for the Eleven Point National Scenic River. It will be at least an interim capacity which can be used by management until additional data can be collected on user impacts. The end product of this project will also include the necessary control and monitoring measures.

The following steps will be taken to establish a new carrying capacity for the Eleven Point National Scenic River:

A. Determination of Management Objectives

Management objectives should define, as specifically as possible, the kind of recreational opportunity or opportunities that the area is to provide. (Lime 1979). Two types of management objectives have been differentiated by Lime: (1) Broad objectives influenced or controlled by enabling legislation and general administrative policy; and (2) more explicit objectives that delineate the desired environmental setting to be sustained and user experience the area is to provide.

It is the fundamental responsibility of the Forest Service to conserve public funds, respect constitutional rights, comply with due process requirements, and avoid unauthorized actions. Under these general responsibilities, a recreation manager has at least three objectives:

1. To preserve and protect the resource.
   (The manager is a caretaker of public property and manages it in trust for the public interest).

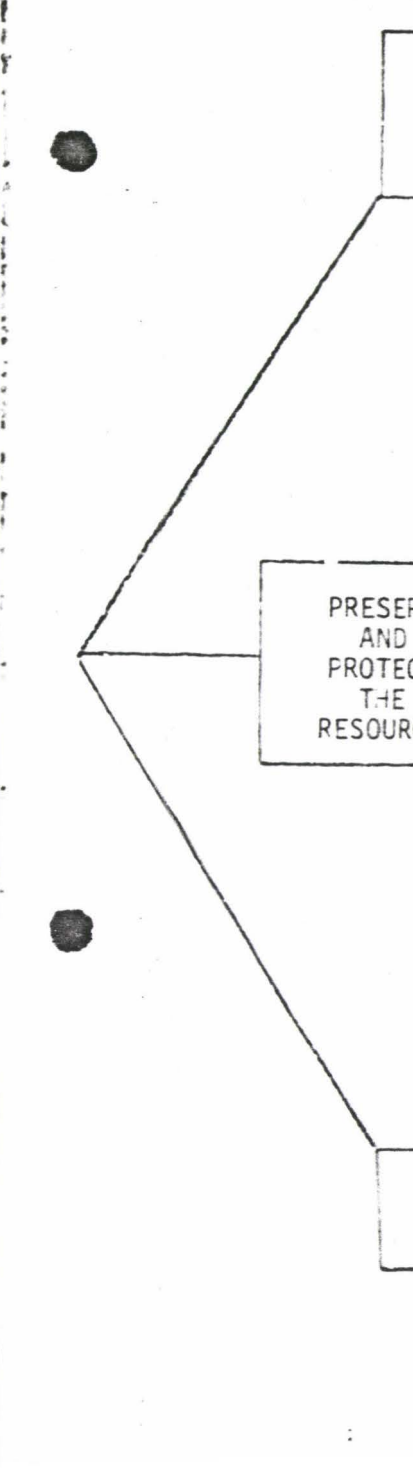
2. To protect the area, within the limits of public policy, from harm in connection with his use of the resource.
   (The manager is a protector of public health and safety).

3. To provide, preserve, and enhance satisfying recreational opportunities.
   (The manager is a provider of opportunity).

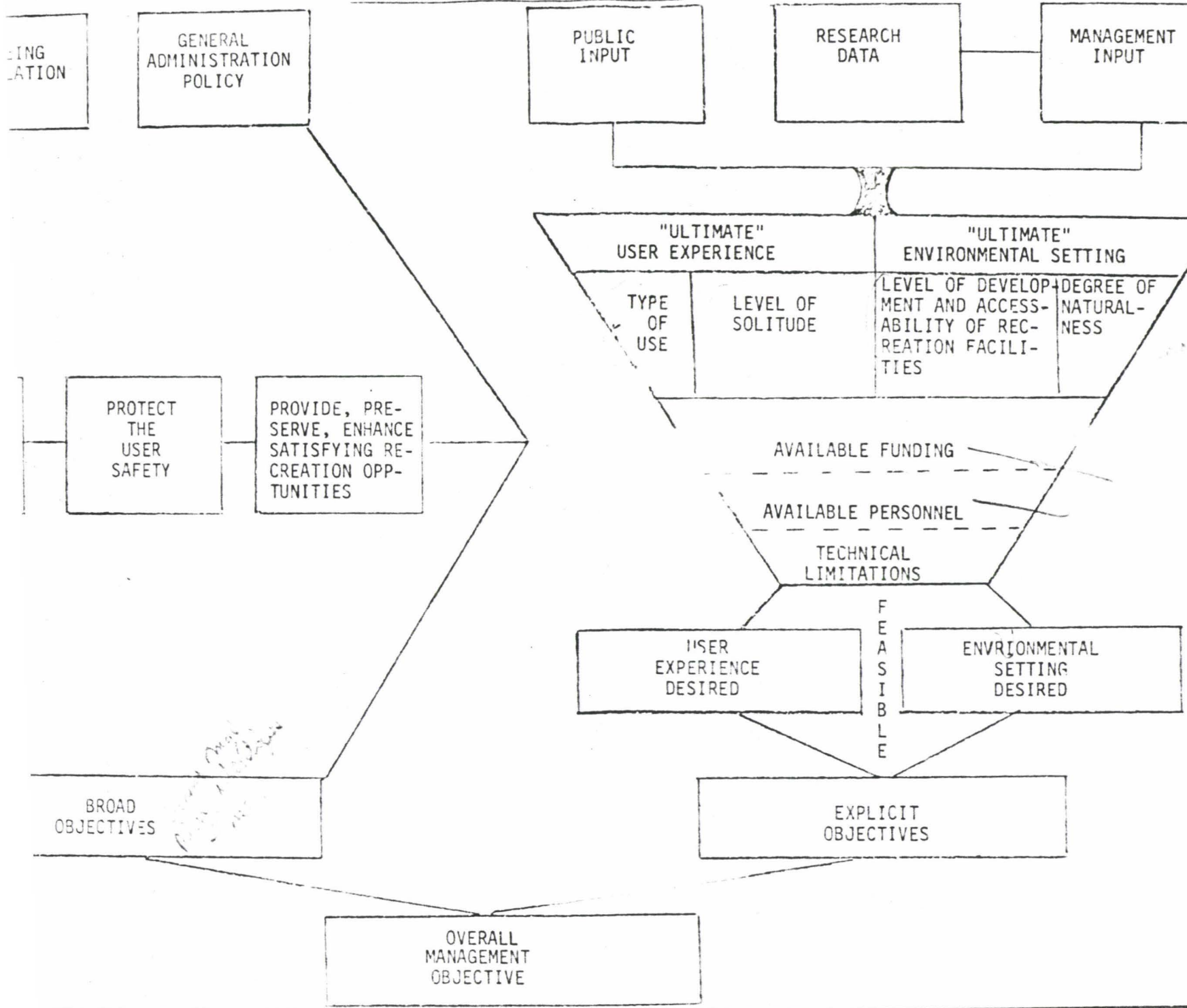
All of the above "broad" objectives have been covered under our existing "Management Plan Objectives" (Eleven Point National Scenic River Unit Plan, Section 120). (Table 3). It is the explicit objectives and/or the use policy statements which need revising and refinement. They must specifically identify the user experience and environmental setting desired. (Fig. 6).

Existing Management Plan Objectives

1. Meet the criteria of legislation as written in Public 90-542, the Wild and Scenic Rivers Act.
2. Establish a philosophy of management for the Scenic River area based on resource quality standards and user experience levels.
3. Develop policies to resolve identified problem areas based on the philosophy of management and existing Forest Service policies. (As new problem areas develop, policies may be formulated. In the interim, established standards will guide decisions).
4. Present an orderly development plan based on resource protection and user needs.
5. Develop policies that will insure the safety of the user, economy of funds, public understanding of management, enforcement of regulations, and research.
6. Consider known aspects of the ecology of the Scenic River Zone, and provide for Man as a part of the natural community, rather than an intruder.
7. Considers local traditional use as compatible with Scenic River management.


PRESER
AND
PROTEC
THE
RESOUR

MANAGEMENT OBJECTIVE FORMULATION Figure 6



Formulation of these "explicit" objectives will be done as a part of our FOREST planning process (Table II). Studies of user attitudes and preferences will be combined with management and other public opinions. Limited funds, personnel availability, and technical limitations must also be taken into consideration. These more explicit objectives will be difficult to define, because they must identify what kind of experiences are to be provided, and how and where these experiences will be managed and maintained (Lime 1977).

The manager must be concerned with such issues as the following:

1. General use intensity or level of solitude desired.
2. Type (s) of use desired--auto camping within the river zone, dispersed camping along the river.
3. Level of development and accessibility of recreation facilities desired--range in the character, number, and location of facilities, and
4. General degree of naturalness desired (on a continuum in which wear and tear to the resource is limited so it would recover naturally over time to an opposite situation in which the site is intensively managed and "hardened" in order to accomodate intensive use).

In any case, these more explicit objectives must be reasonable, practical, and flexible if we ever hope to develop a sound management plan. At this point, we find ourselves in a situation in which we cannot progress in the management of the Eleven Point River because our "policy statement", (explicit objectives) are not current and in line with public sentiment. A good example of this conflict would be the camping issue within the river zone!

Estimate of Physical Carrying Capacity

Physical Carrying Capacity - The present physical carrying capacity for the Eleven Point National Scenic River is 161 canoes per day during April, May and June, and 133 canoes for the balance of the use season. These figures are based on the existing management plan carrying capacity and facility development standards (Eleven Point National Scenic River Unit Plan - Section 240).

Thomasville to Cane Bluff: (Distance 9.4 miles x 3 canoes/mile)	(28)
Cane Bluff to Greer Crossing: (Distance 7 miles x 3 canoes/mile)	21
Greer Crossing to Riverton: (Distance 19 miles x 4 canoes/mile)	76
Riverton to Highway 142 (Distance 9 miles x 4 canoes/mile)	36
	161

( ) Indicates canoe use only during the months of April, May and June.

Existing and Planned Developments

Access Sites	Uses	Parking Units	
*Thomasville	Floaters	6	(7)
	Other Uses	2	
	Total VPU	8	
Cane Bluff	Floaters	14	(7)
	Other Uses	25	
	Total VPU	39	
Greer Crossing	Floaters	32	(26)
	Other Uses	21	
	Total VPU	53	
Turners Mill North	Floaters	9	(9)
	Other Uses	10	
		19	
Turners Mill South	All Uses	8	
	Total VPU	8	
*Riverton	Floaters	38	(12)
		32	
		70	
Highway 142	Floaters	12	
	Other Uses	12	
	Total VPU	24	
	TOTAL VPU	221	(61)

VPU = Vehicle Parking Units
( ) = Number of Parking Units Needed Downstream
* = Sites not Developed as of 1980.

See Figure 3 for existing and planned development locations.

Float Camps	Number Camping Units
Denny Hollow	2
*Cane Bluff	2
*Deadman's Cave	3
*Greer Spring	2
*Little Hurricane Creek	2
Stinking Pond Hollow	4
Horseshoe Bend	6
Barn Hollow	4
Whites Creek	4
Greenbrier Hollow	2
*Turtle Island Spring	2
Boze Mill	2
*Sibkey Spring	2
*Piney Creek	4
Morgan Spring	2
*Rush Creek	2
	45

* = Sites not Developed as of 1980.

Estimate of Facility Carrying Capacity

Under present, unregulated, use conditions, there are not enough developed campsites (float camps) along the Eleven Point River to meet overnight floater needs. Bousquet found in his study in 1976 that the majority of campers camped at convenient locations along the river instead of the developed float camps. We do not know, at this point in time, whether the total planned camping developments, as called for in the Unit Plan, will meet future carrying capacity needs. As a result of the National River Recreation Study, we do know that over 54 percent of those people contacted were opposed to allowing camping only at designated (float camp) locations. Over 85 percent of the public were in favor of camping along the river. Approximately 57 percent of the public were in favor of providing more campsites along the river, and similiarly 58 percent were opposed to having campsites assigned.

"Camping" will be one of the biggest "issues" which must be resolved in our planning effort. This is because of its direct relationship to carrying capacity on the Eleven Point River. Present camping policy in the Unit Plan states:

1. No auto access campgrounds will be allowed inside the Scenic River Zone.
2. Provide developed float camping facilities on the Eleven Point. Allow gravel bar camping. No camping on other public lands inside the Zone.

For this reason, we have taken Messrs. Hendee, Clark, Hogans, Woods, and Koch's system of inventorying dispersed recreation sites and adopted it specifically for river use. This involved the modification of the Code-A-Site card and the instruction sheet. See Appendix I for revised river Code-A-Site system.

We intend to inventory all present and potential float camp sites as well as all existing dispersed sites. This inventory will be completed during the Summer of 1980 by a Forester Trainee who has just completed her Masters Degree in recreation. She will be assisted by a River Technician who is thoroughly familiar with use patterns on the river.

We feel that the Code-A-Site system has several potential uses on the Eleven Point. Some of these potentials are:

1. How many and what kind of dispersed recreational sites exist on the Eleven Point National Scenic River?
2. What is the overnight capacity of the area without forcing development of additional impromptu campsites? (Carrying capacity considerations require this data.)
3. What proportion of sites have sustained different degrees of environmental impact?
4. What are the locations of sites that offer particular kinds of experiences? (Solitude, large parties, etc.).
5. Which sites have management problems or need work? Where are they?
6. What changes occur at the sites over time? (Monitoring)
7. How much dispersed use is occurring on the Eleven Point National Scenic River?

With this type of inventory data, we should be able to make sound decisions concerning carrying capacity and future camping policy on the river. Using the Code-A-Site system we also hope to initiate a monitoring system for both the developed and dispersed sites. By doing so we will be able to establish a common base line from which future ecological impacts can be measured.

Vegetative inventories and transects will be established on a random sample of these sites. This will be done because visitor use may cause irreverisble changes in recreation areas. Management must determine baseline conditions, and take appropriate actions to protect esthetic aspects of impact areas and reverse trends toward further deterioration. It will be necessary to find a graduate student who would be interested in setting up such a monitoring system. At this time, we do not have this type of expertise available on the District or River staff.

Estimate of Ecological Carrying Capacity

The following steps will be taken to estimate the ecolgoical carrying capacity of the Eleven Point National Scenic River by January 1982:

Evaluate ecological research currently being done by the National Park Service on the Current River in Missouri and the Buffalo River in Northern Arkansas.

Compare Park Service research results with existing conditions on the Eleven Point. These two rivers are similiar enough in makeup to draw some parallel assumptions concerning expected ecological impacts.

The following long range steps will also be initiated:

Identify additional ecological research needs on the Eleven Point.

Set objectives for those research programs.

Attempt to interest an ecology professor from a nearby university to do research on the Eleven Point.

Estimate of Future Demands

The present day demand situation has changed considerably in the past year due to the energy situation. Use on the Eleven Point during the 1979 use season dropped by 10 percent. (Fig. 7).

The demand for outdoor recreation resources may be quite different from what it has been over the past two decades. (Marcius & Lime 1974). Demands for river recreation on the Eleven Point will be influenced by:

A. Declining population growth.

B. Aging Society - Present medium age is 35 years of age.

C. Unemployment rate.

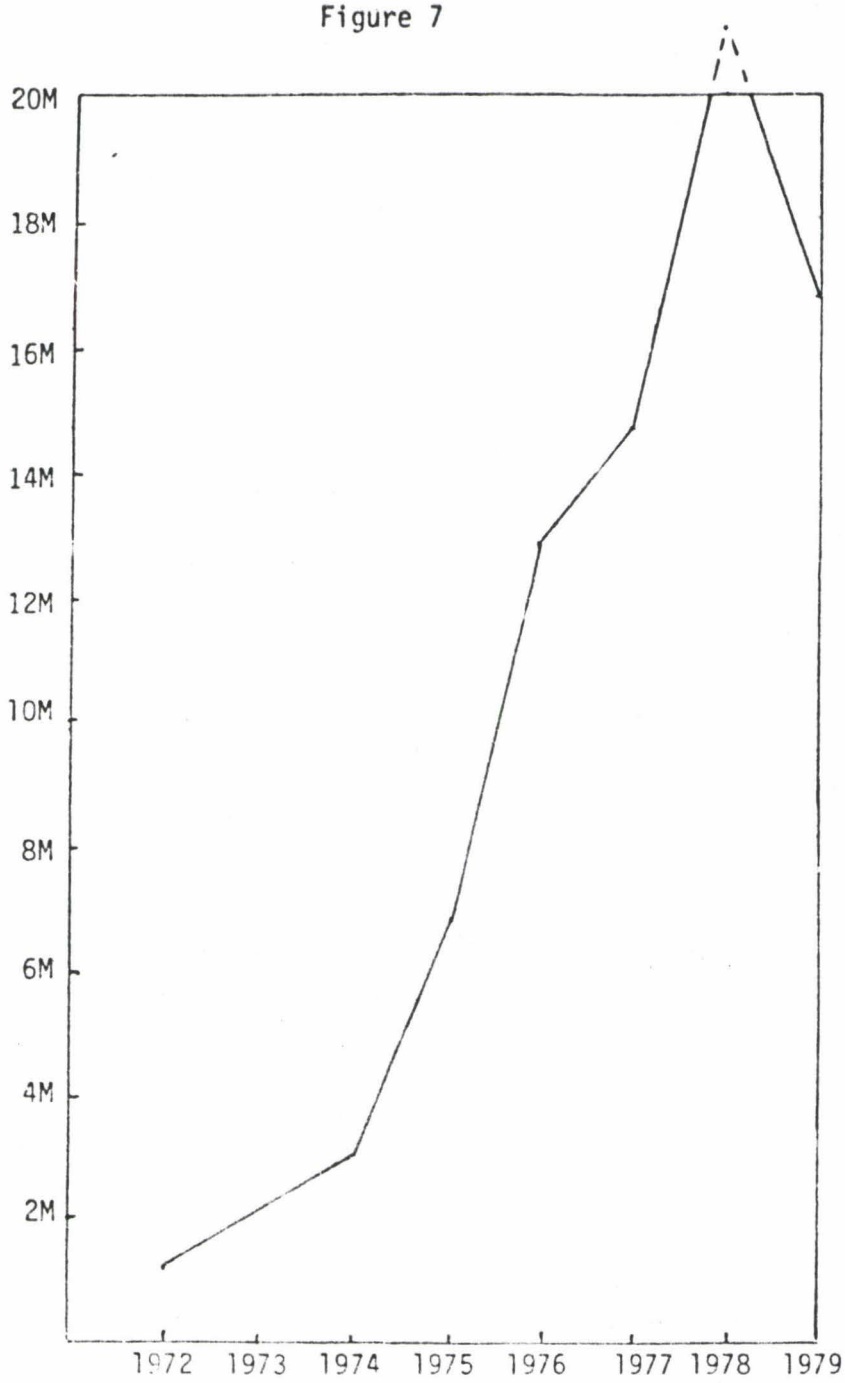
D. Changing economic trends, increased travel costs and reduced discretionary income.

E. Trends toward an "all-season" recreation season.

Truly the future demand for outdoor recreation may not be as great as it was envisioned in the early 70's. Many urban type people may substitute home or community-centered activities for outdoor trips involving costly travel.

No elaborate analysis will be made of "demand" for this project because of the time element and variables involved. It would be desirable to taken an indepth look at demand, if "time" and "money" were available. It is clear, under existing National circumstances, that a simple trend extension of past use would not give us the reliable information we need for estimating future deamnds. We found that sample data used in the State Comprehensive Outdoor Recreation Plan (SCORP) for estimating demand, to be weak for use on the Eleven Point River. We

PAST USE TRENDS
On The
ELEVEN POINT NATIONAL SCENIC RIVER
Figure 7



VISITOR DAY
(A visitor day consists of 12 visitor hours)

M = One Thousand

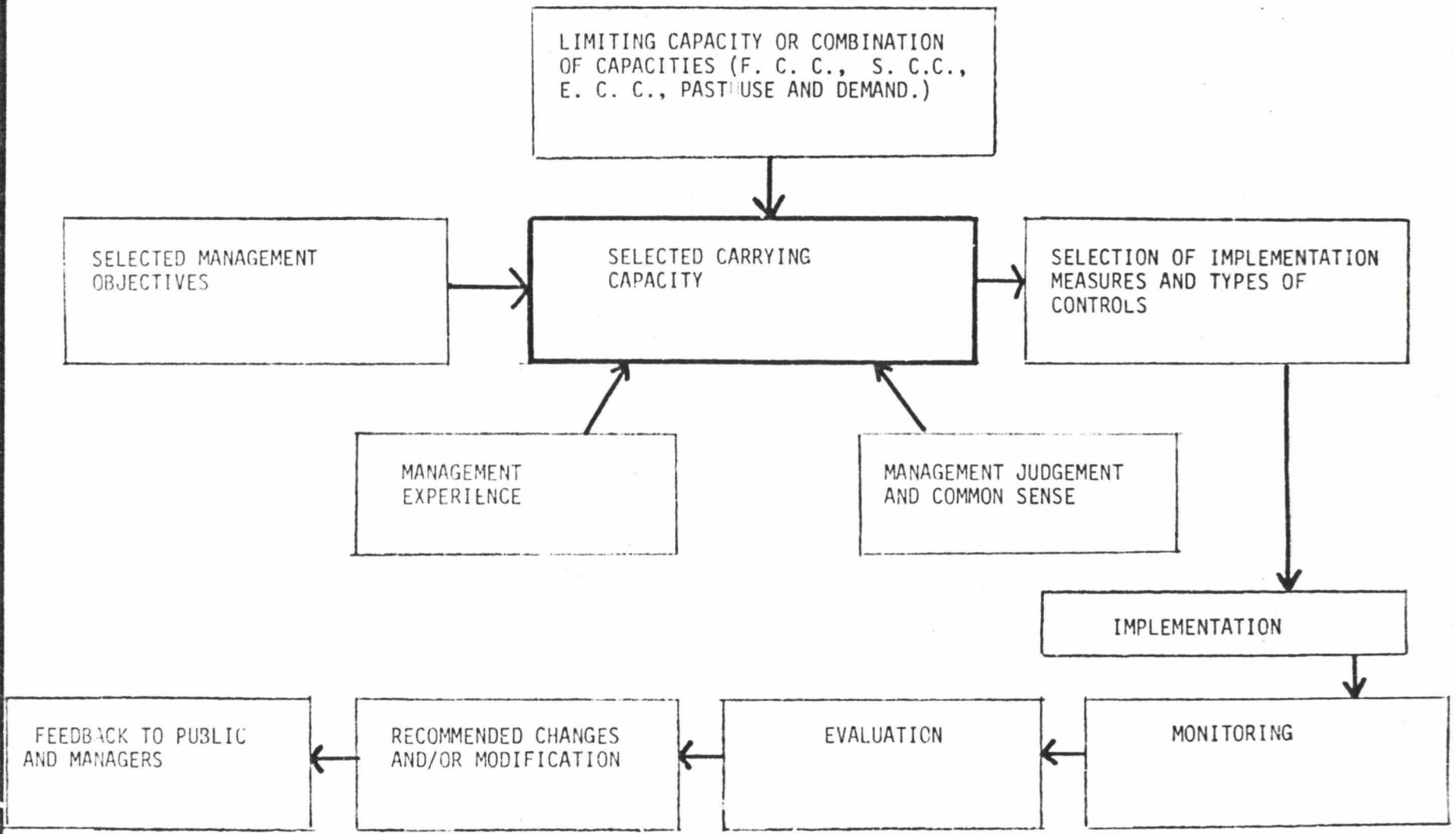
intend therefore, to look at our past use trends and temper them with the current energy situation. It is reasonable to assume however, that there will be a continuing trend toward appreciative-symbolic activities as our population becomes more highly educated and more environmentally aware.

Decision Process

Once the management objectives are settled upon the recreation manager is then left with the difficult decision of deciding how much and what kinds of use are acceptable for a given area,and how and where such uses are to be managed and sustained. He must decide which type of capacity or combination of capacities are most likely to be the limiting factor. This decision process must be tempered with management experience, judgement and good common sense. (Fig. 8).

CARRYING CAPACITY DECISION PROCESS

Figure 8


LIMITING CAPACITY OR COMBINATION OF CAPACITIES (F. C. C., S. C.C., E. C. C., PAST USE AND DEMAND.)
SELECTED MANAGEMENT OBJECTIVES
SELECTED CARRYING CAPACITY
SELECTION OF IMPLEMENTATION MEASURES AND TYPES OF CONTROLS
MANAGEMENT EXPERIENCE
MANAGEMENT JUDGEMENT AND COMMON SENSE
IMPLEMENTATION
MONITORING
EVALUATION
RECOMMENDED CHANGES AND/OR MODIFICATION
FEEDBACK TO PUBLIC AND MANAGERS

Monitoring

In order to be in line with paragraphs (K) (1) (2) and (3) of Section 219.5 (Regional and Forest Planning Process) Volume 44, Number 181 of Federal Register dated September 17, 1979, we would like to suggest that the following monitoring activities be initiated on the Eleven Point River:

1. Increase On-Going Water Quality Monitoring

   The present Eleven Point Management Plan addresses the issue of water quality very clear and direct. We are compelled to insure the water quality of the Eleven Point National Scenic River. The only way this can be done is through a well planned monitoring program. It is also essential that we know whether or not our scenic easement tracts are present or potential pollution sources. We recommend the following monitoring sites be established:

   A. Middle Fork above Thomasville as presently being monitored.

   B. A point directly below Warm Fork Creek. This point should serve two main objectives: (1) Monitor pollution created by Doss and Harper Gravel Plant and (2) Monitor quality upstream from Shaw and Staack Scenic Easements.

   C. A proposed point at Cane Bluff Access. This point should serve to monitor the effects of both Shaw and Staack livestock operations upstream.

   D. Greer Spring. Since its flow doubles the water volume of the river, this point should definitely be monitored. (This location could replace the existing monitoring location at Huff Spring).

   E. Riverton. We feel this point is needed because of the distance of approximately 20 miles between Greer Spring and Riverton. This portion of the river presently receives 75 percent of the entire public use on the river.

F. Narrows at Highway 142. This point should be monitored because of the Pigman Ranch and three other scenic easement tracts involved in livestock production. In addition, this point would also furnish a source of data from the three large springs on the Narrows Tract, plus Frederick Creek.

2. Continue to use the "National River Recreation Study Survey" to Monitor Social and River Management Impacts.

This can be accomplished either of two ways:

A. Conduct a complete survey every three years using all of the National Survey questions.

B. Conduct a "mini" survey every year using pre-selected questions from the National Survey.

The National River Recreation Survey will be an invaluable tool for monitoring changes in the character of river use over time.

3. Develop a System of Monitoring Ecological Changes Within the River Zone.

Use of the river zone by people naturally will result in some ecological changes. These individual impacts are usually minute, but tend to compound with increasing numbers of users. The following monitoring steps are recommended:

A. Conduct a comprehensive inventory of the diverse vegetation within the river zone.

B. Random sample developed and dispersed campsites along the river which have been identified through the Code-A-Site inventory system. This should involve the establishment of permanent transect lines which can be remeasured every third year. This project will have to involve assistance from a University research program.

Funding

Information about future funding and personnel may constrain the kinds of management objectives or carrying capacity selected. These factors are often viewed as limiting the effectiveness of management. Detailed funding information is essential in selecting "realistic" management objectives. Certainly, if trained personnel were unavailable to regulate river use and enforce compliance, objectives which require high intensities of management should not be selected. Likewise, objectives which require facility development for their attainment must be rejected if budgets are expected to be very low or do not contain construction monies (Brown, 1977).

Since Congress established the Eleven Point National Scenic River in 1968, there has been no special funding appropriated specifically for the operation and maintenance of the river. Sufficient funding has not been available to adequately fulfill the "basic" requirements of the Wild and Scenic Rivers Act. As a result, such things as user experience levels and the overall environmental settings have suffered.

There are several costs involved in river management which cannot be truly reflected or programmed into our present RIM system. A prime example of one of these costs is the cost of scenic easement administration. It is a "major" cost which we can not afford to ignore.

If we are to ever get a handle on river management, more effort must be placed on obtaining additional funding for the operation and maintenance of the Eleven Point. The following steps will be emphasized in the upcoming year:

1. Improve "river use data" information using double-sampling and magnetic loop traffic counters.
2. Improve training of river personnel in use of RIM system.

3. Improve the River Managers' understanding and appreciation of the budget process.

4. Identify all areas needing research and see that this information is "officially" passed on to the proper authorities.

5. Investigate all possible areas of special funding and actively solicit needed dollars.

6. Develop a better working relationship between the Forest Service and other interest groups. If possible, schedule a field trip for all those interested and involved in river recreation so that everyone can develop a better understanding and appreciation of each others needs and priorities.

7. Develop a formal proposal for special funding which can be tied back to specific project accomplishments. This proposal should incorporate at least two program levels which can be evaluated on a Regional basis.

8. Strongly recommend renovation of present RIM system to reflect true administrative costs such as scenic easement and ORV administration.

Public Involvement

A new land management plan will be prepared for the Mark Twain National Forest to implement provisions of the Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the National Forest Management Act of 1976. Because the land and resource planning process determines how the Forest will be managed as part of the National Forest System, the public must be encouraged to participate through-out the planning process, starting in the initital stages.

Obtaining attitudes and preferences of recreation users and non-users can help managers set objectives and may suggest needed changes in current policy. Scientifically collected data provides a more accurate cross section of views than do public meetings or occasional letters and personal visits from highly motivated citizens. (Lime 1977). This type of information allows the manager to review the mix of attitudes that exists regarding a specific issue or recreation site. Such information can help managers define specific conditions or actions necessary to achieve management objectives. River user conflicts arise as the result of territorial interests of citizens groups. Although the conflict between specific recreational users can never be fully resolved, the resource manager can adopt certain attitudes and actions to mitigate the conflict. (Terry 1977).

The results of attitude surveys are not a substitute for management experience and good judgement. Usually this information increases the number of alternatives that must be considered. It is also important to know who may oppose various management actions. Once management decisions are made, especially on controversial issues, it may be as important to take appropriate steps to explain to these users why their

preferences cannot be met as it was to learn about the mix of opinions in the first place (Lime 1972).

The revision of the Eleven Point Unit Plan will provide for the airing of interests of local residents as well as visitors from regional metropolitian areas. (Table 4). The process will provide three opportunities for river users and other interested parties to express their concerns over conflicting river uses or resource management treatment. The first stage of the planning process will involve the identification of issues. Input will be received from the following three sources: Research data, management data, and public input data (local and non-local users). The second stage will allow for the analysis of public preferences of specific alternatives in a draft environmental statement and the last stage would involve the appeal process of the final environmental statement.

Table 4

PUBLIC INVOLVEMENT SOURCES

I. Response Forms

II. "Listening Post" using key local network individuals.

III. Research Studies

A. Past

1. Duffield
2. Bousquet
3. National River Recreation Study

B. Planned - University of Missouri

1. Local river use survey
2. Local community resident survey
3. Condensed, non-local, use survey (monitoring)

IV. Public Meetings

A. Formal Structured Meetings

1. Springfield
2. West Plains
3. Kansas City
4. St. Louis
5. Jonesboro, Ark.
6. Memphis, Tenn.

B. Informal "Downhome" Meetings

1. Wilderness Area
2. Winona Area
3. Birch Tree Area
4. Riverton Area
5. Alton Area
6. Braswell Area

SAMPLE OF INTEREST GROUPS

Audubon Society of Missouri
105 Terry Lane
Washington, Mo. 63090

Society of American Foresters
Ozark Chapter, 721 Dean Dr.
Jefferson City, MO. 65101

Burroughs Audubon Society
503 W. Lexington
Independence, MO. 64050

Federated Garden Clubs of Missouri
425 S. Speode Road
St. Louis, MO. 63141

Friends of the Earth
4311 Holmes
Kansas City, MO. 64110

League of Women Voters
24 Deerfield Rd.
St. Louis, MO 63124

Meramic Basin Association
P. O. Box 373
Baldwin, MO. 63011

Ozark Wilderness Waterways Club
10870 Bradshaw
Overland Park, KS. 66212

Sierra Club, Ozark Chapter
707 Clayton
Columbia, MO. 65201

Tennessee Scenic Rivers Assn.
P. O. Box 3104
Nashville, TN. 37219

U. S. Canoe Association
606 Rass St.
Middleton, OK. 45042

Warrensburg Canoe Club
512 Christopher
Warrensburg, MO 64093

Joe Cooke, Chairman
River Road Committee
Ozark Hills and River Landowner Assn
Star Rt. Box 5
Alton, MO. 65606

Mr. David Smallwood
Box 1261
Jefferson City, MO. 65101

Taken from Keyman List 2/15/80

OTHER AGENCIES INVOLVED

Oregon County Court
Courthouse
Alton, MO. 65506

Oregon County Sheriff's Dept.
Courthouse
Alton, MO. 65606

Missouri Department of Conservation
Eminence, MO. 65466

Missouri State Highway Dept.
Jefferson City, MO. 65101

U. S. Army Corp. of Engineers
Little Rock, ARK.

Missouri State Water Patrol
Jefferson City, MO. 65101

APPENDIX

POTENTIAL USE OF CODE-A-SITE DATA
ELEVEN POINT RIVER PROJECT

1. How many and what kind of dispersed recreational sites exist on the Eleven Point National Scenic River?
2. What is the overnight capacity of the area without forcing development of additional impromptu campsites? (Carrying capacity considerations require this data.)
3. What proportion of sites have sustained different degrees of environmental impact?
4. What are the locations of the sites that offer particular kinds of experiences? (Solitude, large parties, etc.).
5. Which sites have management problems or need maintenance work? Where are they?
6. What changes occur at the sites over time? (Monitoring)
7. How much dispersed use is occurring on the Eleven Point National Scenic River?

INSTRUCTIONS FOR CODING THE FRONT OF THE CODE-A-SITE CARD

I. Descriptive Information (1 through 10)

1. Type of Area. Check the general category of the area in which the site is located.
   A. Dispersed roaded (semi-primitive)
   B. Back country or Roadless area. (semi-primitive, unroaded)
   C. Wilderness (legal)
   D. Scenic River (legal)

2. Water Access.
   Year round (Accessible by motor craft year round)
   Seasonal (Not accessible by motor craft during low water)

3. Kind of Access to the Site.
   A. River only
   B. Foot trail only
   C. Unauthorized road
   D. Combination river and road
   E. Other (specify)

4. Site Location in Reference to the River
   A. Gravel bar (relatively free of vegetation)
   B. Island (completely surrounded by water at normal river level)
   C. At water level (subject to flooding.)
   D. Above water level, bank (protected from flooding)
   E. Slough (site located off main river channel)

5. Distance of Site From Trail or River

   Check the appropriate box. Specify distance and direction from river to center of site (fire ring if present) in the shaded box provided (53 ft SW). Use the space provided in the middle of the card if needed for additional comments.

6. Type of Site

   A. Potential float camp
   B. Developed float camp
   C. Undeveloped dispersed river camp
   D. Trail camp

7. Tents

   Suitability - Check yes or no to indicate if the site is suitable for tents. Use the space provided to explain why or why not. Indicate number of tent spaces in shaded box.

8. Watercraft Suitability

   Is docking area located in slow water (movement) area? (Check yes or no). Insert number of canoes or johnboat spaces available at docking area. Use remarks area to explain limitations.

9. Site Origin and Current Status (Check the appropriate box).

   A. Origin (Check one)
      1. Official-planned, designed and constructed by the managing agency.
      2. Impromptu - Sites established by floaters, hikers or drive-ins.
   B. Current Status (check one)
      1. Unimproved - No agency improvements or facilities provided.
      2. Minor improvements - (Homemade firerings, etc.). Site not shown on maps.
      3. Major improvements - (Picnic tables, fire rings, toilets, etc.). Sites indicated on maps.

10. Other Sites

A. Number of sites within view - check the category which indicated the number of sites within view from the site being inventoried. If more than six are within view, specify the maximum number in the shaded box.

B. Number of sites within one-half mile. (May be completed in the office). Check the box which indicated the number of sites within one-half mile from the site being inventoried. Specify the exact number in the shaded box. (This number may change as use increases in the area and new sites are established.)

II. Site Resources (11 through 15)

Definitions: 1. Onsite -- Within 200 feet from edge of site.
2. Offsite -- Over 200 feet from edge of site.

11. Water

A. Availability
1. Onsite - Check yes or no
2. Offsite - Check yes or no

B. Source -- Check all choices that apply as a source of water to the site:
1. Stream
2. Spring
3. Lake - Pond

C. Continuity - - Check whether the water source is year-round or seasonal. If seasonal, specify when it is available
1. Year round
2. Seasonal

12. Firewood

A. Availability

1. Onsite -check yes or no
2. Offsite - check yes or no

B. Source

1. Natural debris--dead limbs and down trees which normally occur.
2. Slash -- debris left by logging operations.
3. Other -- Any other natural sources (insect outbreak, etc.

C. Amount

1. Abundant -- large concentration
2. Available -- but could be depleted with heavy use.
3. Scarce -- firewood will soon be exhausted
4. None - live vegetation only

13. Fire Hazard (Check yes or no)
(Example, during periods of extremely dry weather, grass next to the site will be an extreme fire hazard). Comments - Describe hazard and recommend method of hazard removal.

14. Forage - Omit item

15. Other Resources

A. Berrypicking
B. Repelling
C. Wildflowers
D. Hiking
E. None

III. Area Attractions and Opportunities

Check opportunities or attractions that apply and list any not specifically listed on the card.

Swimming	Fishing
Cliffs	Hunting
Springs	Scenery
Camping	Rock collection
Picnicking	Caves
Historical sites	

IV. Facilities (17 through 19)

17. Solitude

A. Good - well screened from river. (little or no distraction).
B. Fair
C. Poor - Exposed (good chance of frequent distraction)

18. Toilets

A. None - No toilet facilities
B. Other - User built device
C. Compost type facilities
D. Pit - Sealed vault (note access route in remarks section)

19. Specific Number and Kinds of Facilities Available

A. No facilities - # of present or potential units
B. Trash collectors (cans, bins, etc.).
C. Information Signs - major interpretive type
D. Tables
E. Fireplace Grills
(Write in number after each entry.)

V. Special Problems for User

20. Check yes or no for special problems (mosquitoes, flooding, water access, hazardous trees - specify in remarks section).

Example: This site is subject to flooding and has no escape route to high ground.

VI. Ecological Information:

21. Impact of Previous Use

The category calls for subjective field judgements of use impacts. To what extent is ground vegetation impacted or the site denuded? Are there any exposed roots, dead trees? Is there any erosion?

Use - Impact Cagegories

A. Extreme Impacts - All previous ground vegetation gone, many roots exposed. Erosion beginning. Soil compacted.

B. Heavy Impact - Site sould rehabilitate if not used. Most ground vegetation gone. Some roots exposed. No permanent erosion.

C. Moderate Impact - Some denuded spots in ground cover, but vegetation is relatively intact. No exposed roots and impact is limited to the immediate site.

D. Light Impact - Ground vegetation completely intact.

22. Ground Cover - Check percentages most closely representing amount of ground cover at site.

23. Vegetation - Indicate at this location if there is no ground cover. Specify vegetation nature on the back of the card. Description should be sufficient to identify the plant communities involved. Information on the stand should include age, height, D.B.H., vigor, successional stage, or other information the manager may find useful.

24. Crown Cover - Check percentages most closely representing amount of crown cover at the site.

25. Exposure - Aspect to which the site is generally exposed. Check appropriate block.

26. Capacity - Facility capacity present and potential. Check appropriate block to indicate sites present capacity or potential capacity. Note what site is best suited for in remarks.

Floatcamp Design Guidelines

Adequate spacing between units.
Good eye level screening between units and river.
Overhead Shade.
Adjacent to slough.

Unit Size	Impact Area	Distance Between Units
Single Unit (1-4 people)	35 foot diameter	40-60 feet
Small Group (5-8 people)	55 foot diameter	60-80 feet
Large Group (9-20 people)	85 foot diameter	80-120 feet

27. Frequency of Use - Appraise how often the site is used by inspecting ecological impact and other evidence.

A. Constant - Always used on weekends during the season and frequently during the week.
B. Frequent - Used much of the time, almost always during heavy use periods such as "Most Weekends."
C. Moderate - Used only a few times during the season.
D. Slight - Used only a few times a season such as during heavy use periods.
E. Infrequent - Use is light - site may be used only once a season or not at all.

28. Special Problems or Hazards Associated with the Site.

A. Litter - Is the site frequently left littered?
B. Soil Compaction - Does the soil visually appear to be compacted?
C. Erosion - Is erosion actively taking place?
D. Vegetative Damage - Is vegetation, both ground and overstory, being damaged or lost (cutting, axe or lantern marks on trees?)

E. Fire - Is this site a high risk area as far as escape fires are concerned?

F. Vandalism - Has this site been vandalized within the past three years?

G. Flooding - Does this site have a safe escape route in case of flash flooding?

H. Other Problems or Hazards - (Specify on center of card.)

VII. Schematic Drawing (Bottom Center of Card)

Use this portion of card for a schematic drawing of the site. Indicate location of fire ring (X), Picnic table (π), foot trails (~~), photo points (PP), roads (~~), toilet (π), spring (~), possible location of sleeping space (○). Specify deminsions of the site and its location with respect to roads, trails, and the river.

VIII. Instruction for Back of Card - The following information is to be included on the back of the card. Most items on the back may be completed in the office.

1. Location Data: Use standard agency code numbers.

   A. Region - The administrative region in which the site is located.

   B. Forest - Name and number of National Forest.

   C. District - Name and number of District.

   D. Management Unit - This is simply a "catchall" term for the many ways Districts identify sites (Barn Hollow Float Camp or RIM number if assigned).

   E. Site Number - Indicate site number according to the following code sequence:

   First Digit - River Segment

   1. Thomasville to Cane Bluff
   2. Cane Bluff to Greer Crossing
   3. Greer Crossing to Turner Mill
   4. Turner Mill to Bliss
   5. Bliss to Riverton
   6. Riverton to Narrows

   Second Digit - Camp Number

   Third Digit - Type of Camp

   X - Developed Float Camp

   Y - Potential Float Camp

   C - Dispersed Camp Site

   Fourth Digit - Location of Camp (Going Downstream)

   R- Right side

   L - Left Side

F. Legal Description - Indicate the township, range, and section in which the site is located. Place a dot in the box provided to illustrate where the site is located in the section.

G. Date Coded - Indicate the date on which the site was inventoried.

H. Coded By - Place name of person or persons inventorying the site.

2. General Description of the Site

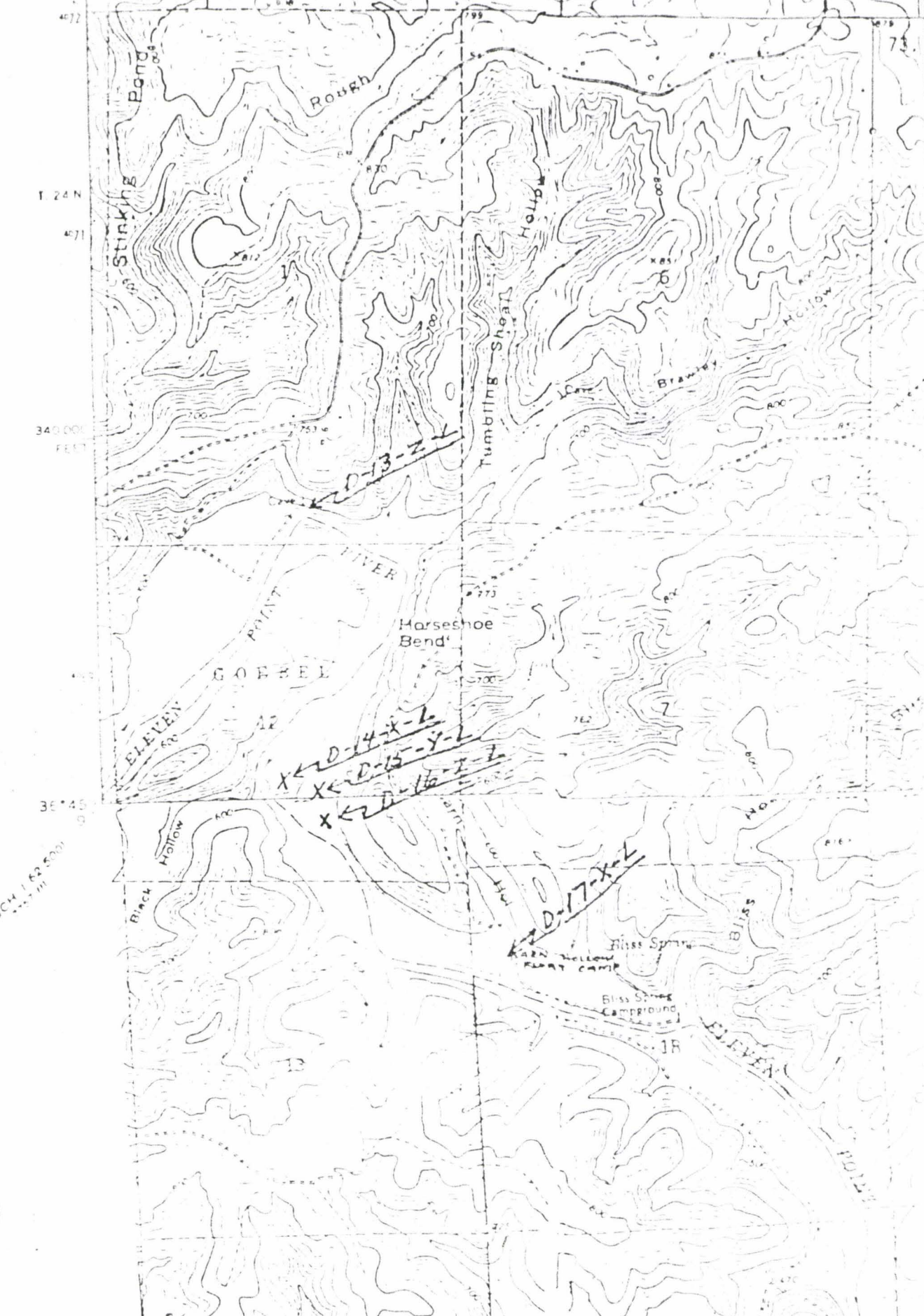
Describe the site as you would to a floater looking for a campsite. Example - Heavily used site at the mouth of Wildcat Hollow. Located at the waters edge with plenty of shade. No other camp sites within the vicinity.

3. Management Notes

Use this space for notations or observations about the management of the site. It can be used to record possible work needs which the manager would want to know about. For example, hazardous trees, broken picnic tables, toilet needs pumping, etc. Concentrate on describing the situation. Give "your" recommendation as to rehabilitation, obliteration, development, etc.

4. Future Management Recommendations

This space is reserved for the manager to indicate anything he thinks should be done to the site in the future.


Rough
Stinking Pond
Tumbling Shear Hollow
Brawley
D-13-Z-1
RIVER
Horseshoe Bend
GOEBEL
ELEVEN
D-14-X-1
D-15-Y-1
D-16-Z-1
Black Hollow
D-17-X-1
Bliss Spring
Bliss Spring Campground
BLISS
ELEVEN
T. 24 N.

CHECK (X) APPROPRIATE CATEGORIES

PLEASE READ CODE BOOK PRIOR TO USING THIS CARD

CODE · A · SITE
(DISPERSED RECREATION SITE INVENTORY)
U S D A FOREST SERVICE
PACIFIC NORTHWEST FOREST & RANGE EXPERIMENT STATION
5-75 265672-73X McREE SYSTEMS · SEATTLE, WA

I DESCRIPTIVE

TYPE OF AREA (1)
- DISPERSED
- BACK COUNTRY
- WILDERNESS
- X SCENIC RIVER

(2)
- YEAR ROUND
- SEASONAL (SPECIFY →)

ACCESS (SPECIFY NAME OR NO. IF ANY →) (3)
- X RIVER
- TRAIL
- INFORMAL RD
- RIVER/ROAD
- OTHER (SPECIFY →)

SITE LOCATION (4)
- GRAVEL BAR
- ISLAND
- WATER LEVEL
- X ABOVE W. L.
- X SLOUGH

DISTANCE FROM TRAIL OR RIVER (5)
- 0-50'
- 51-100'
- X 101-200'
- OVER 200'

N 125 FT.

TYPE OF SITE (6)
- POTENTIAL F.C.
- DEVELOPED F.C.
- X UNDEVELOPED DISPERSED
- TRAIL CAMP

TENT SUITABILITY ← YES (NO) WHY? →
2 NO. OF SPACES 6
44
(7) TENTS

WATER CRAFT SUITABILITY ← YES (NO) WHY? →
2 NO. OF SPACES
44
(8) WATER CRAFT

SITE ORIGIN & CURRENT STATUS (9)
- OFFICIAL
- IMPROMPTU
- X UNIMPROVED
- MINOR (SPECIFY →) IMPROVEMENTS
- MAJOR (SPECIFY →) IMPROVEMENTS

OTHER SITES (10)
- X 0 — NOT IN VIEW
- 1-3
- 4-5
- 6+

NOT IN 1/2 MILE
- X 0
- 1-3
- 4-5
- 6+ — 1

KEY #

USE THIS AREA WHEN SPECIFICS ARE REQUIRED OR TO RECORD ADDITIONAL DATA

6 Very popular site for groups
7 Tent pads surfaced with sawdust
8 No canoe stacking areas provided
18 Solid waste must be hauled by way of River
19 One official Bulletin Board

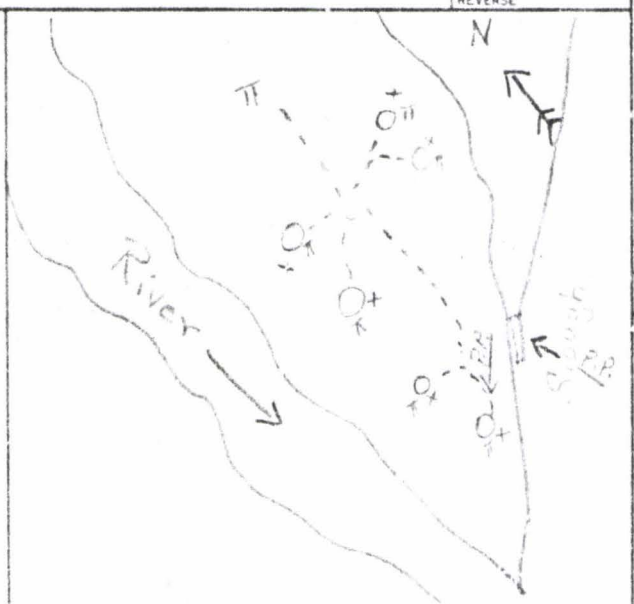
ADDITIONAL NOTES ON REVERSE X

VII SCHEMATIC DRAWING

USE BOX TO MAKE A ROUGH SKETCH OF SITE

INDICATE POSSIBLE TENT (X) AND VEHICLE (O) SPACES

INDICATE NORTH



II SITE RESOURCES

IN SITE (YES/NO)	WATER (SPECIFY SOURCE)	FIREWOOD (12) (SPECIFY LOCATION) AVAIL.	SOURCE	AMOUNT	FORAGE (14) (SPECIFY TYPE & LOCATION) AVAIL.	AMOUNT	OTHER RESOURCES (15) (SPECIFY IN COMMENTS SECTION)
OFF SITE (YES/NO)							
STREAM							
SPRING							
LAKE							

III AREA ATTRACTIONS & OPPORTUNITIES (16)

	SOLITUDE (17)	GOOD	FAIR	POOR
SWIMMING				
X FISHING				
CLIFFS				
HUNTING				
SPRINGS				
SCENERY				
CAMPING				
ROCK COLL.				
PICNICKING				
CAVES				
X HISTORIC				

V ECOLOGICAL

FREQUENCY OF USE (27)
- CONSTANT
- FREQUENT
- X MODERATE
- SLIGHT
- INFREQUENT

CAPACITY (26)

PRES.	POT.
GROUP	FAMILY
2 UNIT	4 UNIT
6 UNIT	OTHER
L. GRP.	S. GRP.

EXPOSURE (25)

NE	NORTH
NW	EAST
SE	SOUTH
SW	WEST

CROWN COVER (24)
- NONE
- 26-50% / 1-25%
- 76-100% / 51-75%

(23) VEGETATION SPECIES IN RANK — NO GROUND COVER

GROUND COVER (22)
- 26-50% / 1-25%
- 76-100% / 51-75%

IMPACT OF PREVIOUS USE (21)
- EXTREME
- HEAVY
- MODERATE
- X LIGHT

IV FACILITIES

V (20) SPECIAL PROBLEMS FOR USER (← SPECIFY) NO X YES →

(19) NOTE: OTHERS IN REMARKS
- NO FACILITIES
- GARBAGE CANS
- INFORMATIONAL SIGNS 1
- TABLES 2
- X FIREPLACE 6

TOILETS (18) (SPECIFY LOCATION) ←
- NONE
- OTHER
- COMPOST
- SEALED VAULT 1
- X FLUSH

SPECIAL PROB. & HAZARD (28)
- LITTER
- SOIL COMP.
- EROSION
- VEG. DAMAGE
- FIRE
- X VANDALISM
- FLOODING
- OTHER SPECIFY

FOREST CODE	DISTRICT CODE	MGMT. UNIT	SITE NUMBER
05	26		24X-6

REGION 9 FOREST Mark Twain DISTRICT Winona - 26

TOWNSHIP 24N RANGE 2W SECTION 12 DOT [X] MGMT UNIT Horseshoe Bend F.C. SITE NO. 561

DATE CODED 2-6-80 CODED BY M. Easterbrook

GENERAL DESCRIPTION OF SITE	Site is an official, 6 Unit, Float Camp. It is a very popular site with River-goers.
MANAGEMENT NOTES	At some future point in time, site will have to be rehabilitated - There is another good group site on the opposite side of the slough. Both leading to camping units (Stair steps) must be relocated.
FUTURE MANAGEMENT RECOMMENDATIONS AND SITE COSTS	

KEY #	USE THIS AREA WHEN SPECIFICS ARE REQUIRED OR TO RECORD ADDITIONAL DATA
	(23) ON SITE VEGETATION Site is located in a mixed, pole-size, Oak-History stand, with some foliage. Stand is vigorous with a few trees damaged with axe marks.
	(24) OFF SITE VEGETATION Site is camping entire ridge between Main River and Slough.

EXISTING ADMINISTRATIVE POLICIES

Fire

The use of mechanized fire fighting equipment within the "seen" area will be restricted to extreme burning conditions when this type of control is necessary to protect high-value properties and resources. No restrictions on equipment use outside the "seen" area.

Information and Education

1. Public relation activities having to do with the river will be confined to explaining current or future management policies, regulations, and available facilities.
2. Printed material used to explain regulations, natural history, human history, or camping methods will be professionally prepared and made available to all users.
3. Rangers will see that the publics, local and non-local, are informed of regulations, and reasons for implementation of those regulations.

Land Adjustment

Land having outstanding recreational, aesthetic, historical or archaeological values, and lands needed for the protection of the Scenic River environment will, in most cases, be purchased in fee.

Law Enforcement

Law enforcement will be a regular part of recreation management on the Eleven Point River.

Recreation Use Determination

A travel permit system for watercraft will be used on the Eleven Point. Information from permits will be utilized in refining carrying capacity.

Signs and Signing

There will be minimal use of signing within sight of the river.

Visitor Information Services

Provide visitor information services in the Scenic River Zone to help meet objectives and standards.

Maintenance

Developed sites, float camps, hiking trails and the general river and forest landscape will be maintained to levels that insure protection of the sites, maintain aesthetic values, safeguard the general health of the user and recognize economy of funds.

EXISTING RESOURCE POLICY STATEMENTS

Carrying Capacity

A combined administrative study and research project will be pursued to determine the carrying capacity of the Eleven Point River to support recreation use. A program of research was started in the summer of 1971 as a basis for carrying capacity determination.

A carrying capacity will be set for the river upon which planning and management will proceed, until the carrying capacity study is completed.

Air Quality

Any man-caused activity on Federal lands, that will lower present air quality in violation of Federal Standards or Missouri Ambient Air Quality Standards, will not be permitted.

Fish and Wildlife

Primary emphasis is to protect and enhance all terrestrial and acquatic fauna while providing opportunities for both consumptive (hunting and fishing) and non-consumptive uses of the wildlife resource. Will continue the trout-stocking program within the Scenic River Area. Reestablish extripated species such as ruffled grouse and river otter through cooperation with the Missouri Department of Conservation.

Minerals

Gravel bars within the Scenic River Zone will be utilized as nonconsumptive features, recognizing the value as other than common minerals. Mineral utilization will be restricted by special provisions to assure safeguards against pollution and unnecessary impairment of the scenery.

Solitude

All man caused sounds in excess of the following sound levels will be considered intrusions on the solitude of the riverscape. This will include both air and ground conveyances:

65 d (A) (at 50 feet) in all undeveloped areas and float camps.

80 d (A) (at 50 feet) in all developed areas such as watercraft access points, road crossing and picnic grounds.

Unique Areas

An intensive and comprehensive inventory, interpretation and management plan will be made for each area that falls in the unique category.

Vegetation and Soils

Planting, seeding, or manipulation of vegetation will be limited to native plants common and characteristic of the site or plant community involved.

No commercial harvest or removal of wood products within the "seen" area and modified management in the remainder of the Scenic River Area. Management of vegetation will not include grazing by livestock, the harvest of hay, or any agricultural practice.

Disturbed areas resulting from fire, blowdown, or other catastrophes will be allowed to recover naturally without seeding, planting, or vegetation manipulation.

Water

Maintain or improve existing water quality.

Camping

No auto access campgrounds will be allowed inside the Scenic River Zone.

Provide developed float camping facilities on the Eleven Point. Allow gravel bar camping. No camping on other public lands inside the zone.

EXISTING USE POLICY STATEMENTS

Canoeing and Boating

Watercraft launching sites with parking will be provided at the following sites:

1. Thomasville
2. Cane Bluff
3. McCormack Lake
4. Greer Crossing
5. Turner Mill South
6. Turner Mill North
7. Riverton
8. Highway 142

Boats with outboard or other engines of more than 25 horsepower, swamp buggies, jet boats, and air propelled boats may not be transported across Forest Service administered land within the Eleven Point Scenic River Area.

Fishing

Sport fishing and gigging should continue as compatible recreation activities, as long as the well being of the fishery resource is not endangered and the river banks and attendant vegetation is not impaired.

Hiking

Build a trail system in selected portions of the Scenic River Area.

Horseback Riding

Riding of horses will not be allowed inside the Scenic River Area.

Picnicking

Picnicking should continue as a compatible recreational activity on the Eleven Point River.

Picnicking facilities will be provided at developed sites only.

Off-Road Vehicles

Motor or air vehicles of any type will not be permitted on public lands within the Scenic River Zone except:

For emergencies, rescue and fire suppression.

At designated access points to the Scenic River.

On designated temporary roads when such use is necessary for proper care and harvest of farm crops or for access to existing residences or private lands or for maintenance and construction of developed facilities or harvest of timber.

Shooting

Regulate indiscriminate shooting of firearms along the river to the extent possible under basic authority of State and Federal statutes.

Development

Experience Level 2

Thomasville Access
Cane Bluff Access
Turner Mill North Access
McCormack Lake Access

Experience Level 3

Greer Crossing Access and Picnic Ground
Riverton Access
Highway 142 Access

Experience Level 2

Hiking Trails and Trail Camps
Boze Mill Area
The Narrows Hiking Area
Pigman Mound
Greer Spring and Trail
Turner Mill South

Experience Level 3

The Narrows Access Area, VIS Center and Picnic Area
Greer Spring Parking Area and VIS Center
Float Camps

Carrying Capacity for Developed Sites

Enforce carrying capacity on all developed sites.

Adjust site carrying capacity based on research data.

Design Standards

1. Locate all development sites except boat access, float camps, and picnic areas on the periphery or outside the zone if possible.
2. Locate all recreation improvements on soils suitable for the intended use and to insure protection of the environment.
3. Locate water and sanitation facilities above the 100 year flood level, and design to prevent water pollution.
4. Treat all areas disturbed by construction to reestablish natural vegetation or cover for soil stability and erosion control.
5. Provide for public safety in the location, design, construction, and maintenance of all facilities and improvements.
6. Administer developed sites in accordance with the assigned experience level, and in a manner that maintains that level.
7. Encourage the private sector to construct recreation facilities for public use outside the Eleven Point River Zone.
8. Enforce the carrying capacity on all developed sites.

Concessions

The establishment of additional concession-type facilities within the Scenic River Area will be prohibited.

Rights-of-Way

Road rights-of-way will not be permitted except for reconstruction of existing highways on the present locations.

Utility rights-of-way may be permitted where stipulations to protect the natural environment and recreational value can be included.

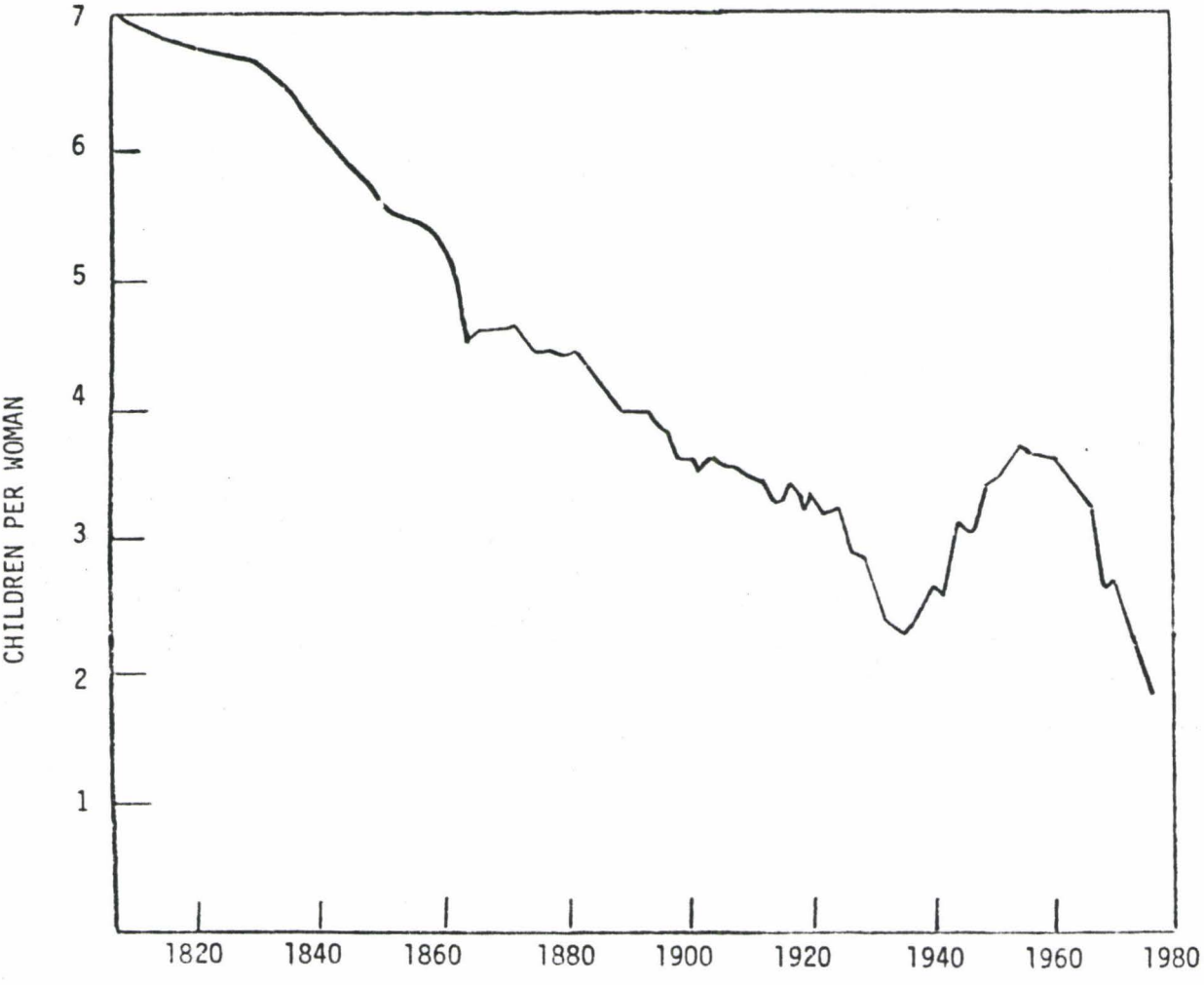
Transportation

The use of motorized vehicles within the Scenic River Area will be restructed by type of use and to designated locations.

Land Use

New agriculture and grazing occupancy permits will not be permitted within the Scenic River Area.

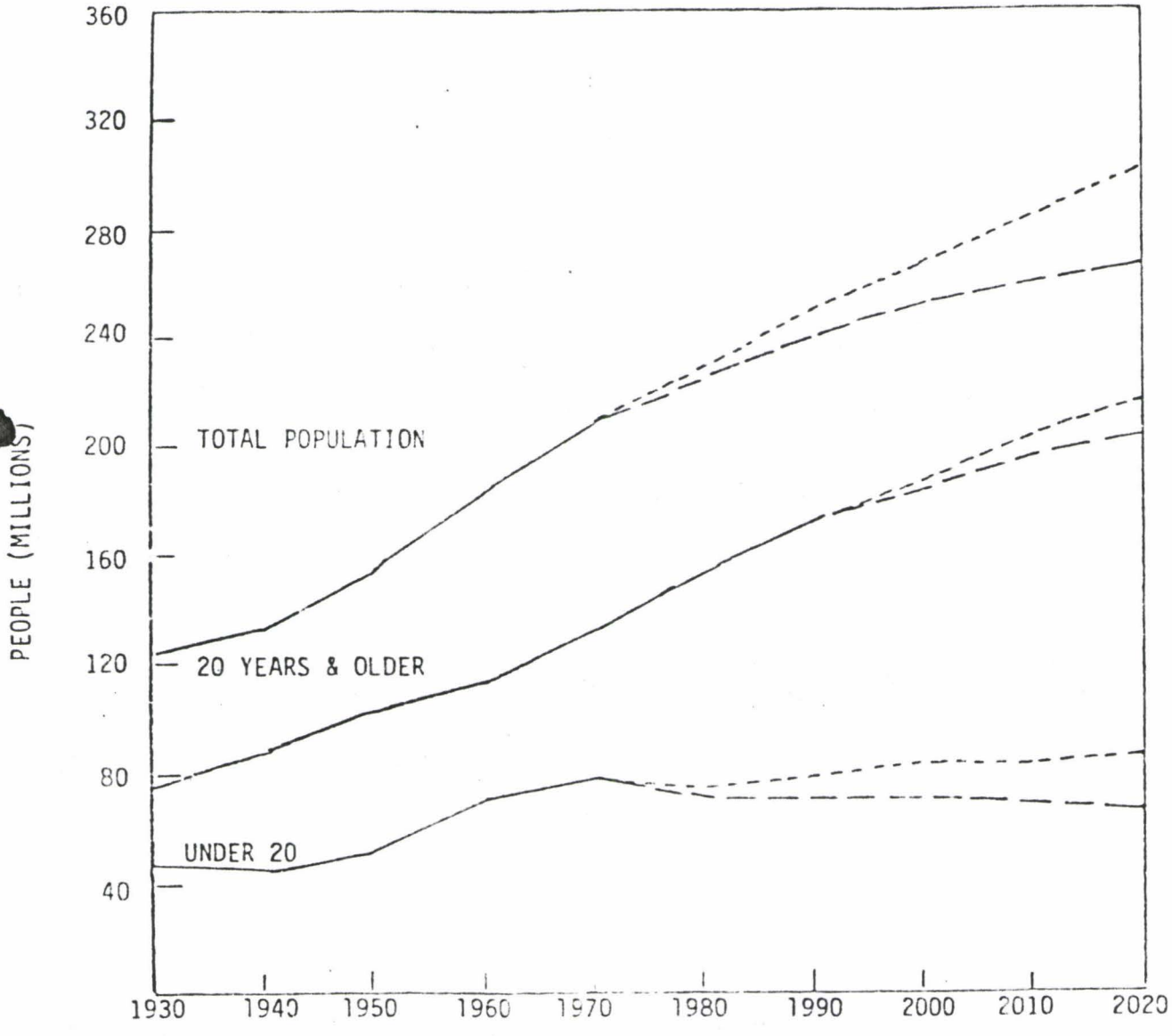
TOTAL U. S. FERTILITY RATE



The total fertility rate in the United States from 1800 to 1974.

(Marcus & Lime 1977.)

TOTAL U. S. POPULATION



Total U. S. population, population 20 years and older, and population under 20 years for 1930, 1940, 1950, 1960, and 1970 with projections to 2020.

(Marcus & Lime 1977)

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